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RUN

August 1991
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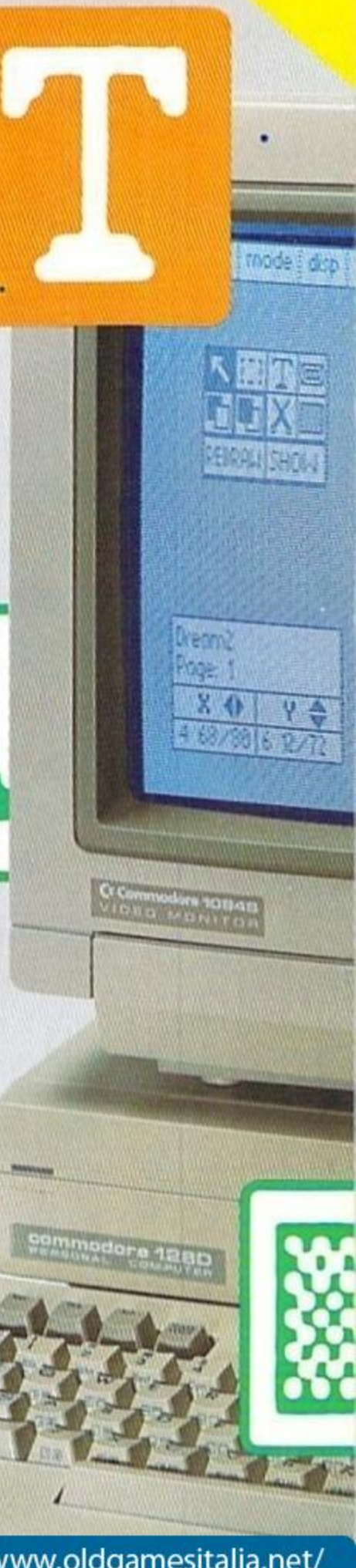

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CSM Prog Protection Manual 1	24
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Lou Sanders Tricks & Tips	16
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Twin Cities 128 Compendium #1	15

GENERAL BUSINESS

CMS Accounting/128	129
CMS Inventory Module 128	53
Data Manager 64	17
Gateway	**26**
KFS Accountant 128	109
Leroy's Label Maker	24
Multiplan	12
Paperclip 3	39
Paperclip Publisher	14
Pocket Dictionary 64/128	10
Pocket Filer 2	29
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Pocket Superpak 2 (Digital)	67
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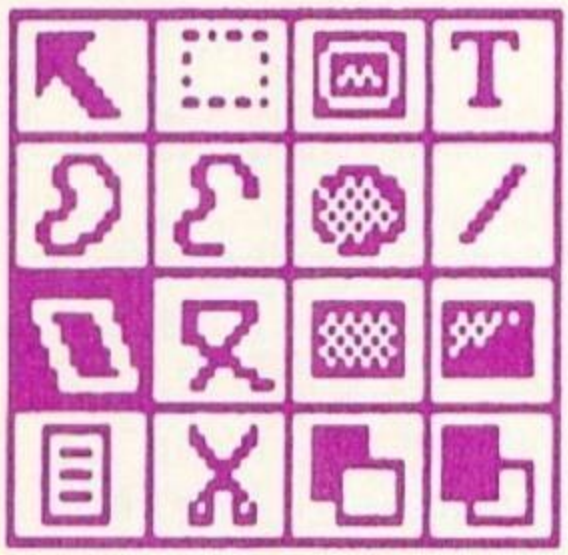
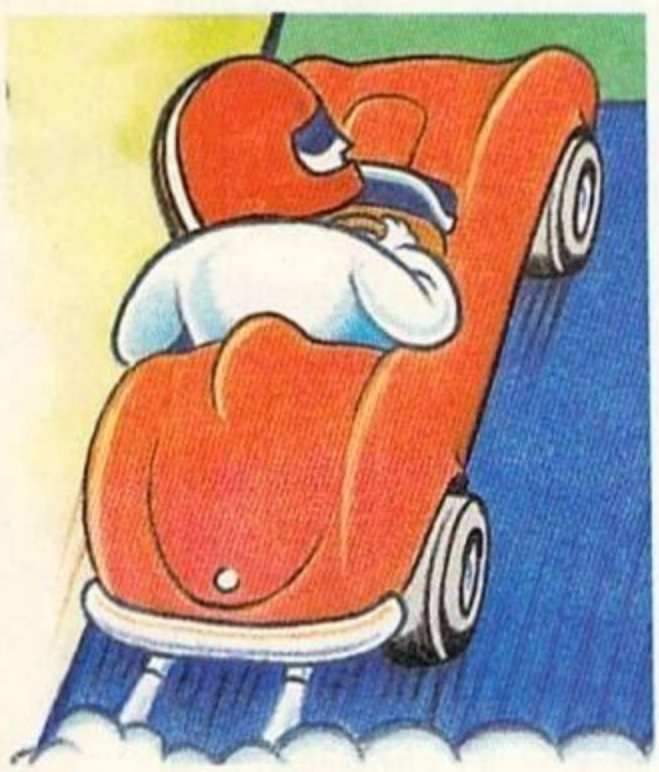
C O N T E N T S

VOLUME 8, NUMBER 4 JULY/AUGUST 1991



PAGE 22



PAGE 44

COVER PHOTOGRAPHED BY ED JUDICE

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FEATURES

22 Read All About It! *by Gerry Descoteaux*
Here's a late-breaking news flash: Use the Commodore/geoPublish combo to handle your desktop publishing needs.

25 geoPublish News *by Robert Austin*
Follow these step-by-step instructions to create your own desktop-published newsletter.

28 Inside Tips on DTP *by Larry McCoy*
Take this pro's advice and you'll soon be producing your own high-quality manuals, newsletters and booklets.

***31 Some Like It Hot** *by Harold Bentley*
Though it's hot outside now, Fuel Compare can help you plan for winter's chill.

***34 Yoot** *by Kirk Ward*
The whole family will enjoy this Korean board game of strategy and chance.

36 Required Reading *by Stéphane Dirschauer*
Here's the answer to *RUN's* frequently asked question: "Can you recommend a good book about . . .?" We sure can!

40 128 Graphics Video Upgrade *by Lou Wallace*
What is a video upgrade, and why would you need one? Lou Wallace tells all.

***44 Roadtest 64** *by Peter Lottrup*
Test your knowledge of traffic signs and travel facts with this great game.

***47 Super Keys** *by Michael Rebella*
Put your function keys to work with this C-64 programming utility.

DEPARTMENTS

6 RUNning Ruminations *by Dennis Brisson*
Don't waste time waiting for your computer to do its thing. These activities are sure to cure the computer blues.

8 Magic *compiled by Tim Walsh*
Make your programs more flashy, put a comma on your keypad and teach your Commodore to play *It's a Small, Small World . . .*.

10 News and New Products *by Janice Greaves*
This time we have news from Commodore, two new printers and some great software.

12 Mail RUN
Since April, we've received a flood of mail from user's groups asking to be added to our list. Here they are, along with letters offering help and advice.

16 Software Gallery *Reviews of:*
- Ultima VI: The False Prophet
- Back to the Future II
- B.A.T.
- Yours, Mine and Ours!!
- DragonStrike
- Questmaster
- Bill & Ted's Excellent Adventure
- Crackdown
- The Untouchables

48 geoWatch *compiled by Janice Greaves*
This issue, geoWatch and ProTips combine to help you with your GEOS applications.

50 128 Mode *by Mark Jordan*
A surprising new language can improve your programming skills—Plain English!

58 Gold Mine *compiled by Louis F. Sander*
Master the universe! This issue, we have tips on Questmaster, SimCity and many other games.

60 RUN's Checksum Program
Run it right, the *first* time.

61 Commodore Clinic *by Ellen Rule*
Learn the secret of your power supply, and get software sources for your 1581.

64 Coming Attractions; List of Advertisers

*** If you'd rather RUN to the beach than sit inside typing program listings, order this issue's programs on the July/August ReRUN disk. Just call 800-343-0728.**

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RUNning Ruminations

It's About Time

Do authority figures accuse you of spending too much time at the computer? Well, let me show you some sure-fire ways to increase your productivity and decrease your wasted time.

I have compiled the following list of things to do while you're waiting . . . waiting for a program to load, for your computer to search its directory or for your printer to print out.

Let's say you waste only four minutes (a low figure) a day waiting for your equipment to perform its tasks. Not much, you say. But by the end of one year, you will have wasted a full day—over 24 waking hours. Rome wasn't built in a day, but if you had a free day tacked onto your life each year, think what you could do . . . and how far ahead of everyone else you would be!

Here's how the pros spend their time while waiting for their computers.

While you're sitting at your computer listening to your equipment whir, you can

- learn to quickly recite the alphabet backwards, so you can appear on *America's Funniest People*
- dare to take a look under your computer system
- dare to clean under your computer system
- try to determine what the ALT key does
- reorganize the contents of your wallet
- clean out the crud between your computer keys
- count the number of pixels on your monitor
- develop a cure for the common cold
- take stock of your life and resolve to accomplish something worthwhile before you hit 40 (If you are over 40, adjust the age ceiling accordingly.)
- resolve to purchase a screen wipe, so you can see what you're typing on your monitor
- figure out π to 20 places
- discover a solution to America's garbage problem
- devise a way to upgrade your Commodore system while still living within your budget
- count the number of times your cursor blinks per minute
- name as many U.S. presidents as you can
- try to recite the lyrics to *Louie, Louie*
- alphabetize your disk collection
- determine the most eye-appealing monitor color combination
- think of 12 new tips that you can send to *RUN*'s Magic column
- try to remember the name of your third grade teacher and what you learned that year
- envision a world without computers
- think of how difficult it is to change yourself and how much more difficult it is to change someone else (an old saying, I think)
- resolve to clean the clutter from your desk (According to recent studies, a clean desk reduces stress and enhances career progress!)
- determine how much time you've wasted reading silly magazine editorials and resolve to use your time more wisely in the future.

Good luck, and happy computing.

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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MAGIC

Watch the border flash when commands are executed and get fast directories on your C-64.

By TIM WALSH

$5C7 40/80 KEY DETECTOR

Use the following program to detect whether the 40/80 key is up or down in C-128 mode. Simply type in 40/80 Detector and run it with the 40/80 key in the up position. If the program doesn't respond to changes in the key's position, press RUN-STOP/RESTORE with the program running, then run it again.

```
Ø REM 4Ø/8Ø KEY DETECT - JAMES KRETCHMAR:REM*119
1Ø SCNCLR:PRINT"IF 4Ø/8Ø KEY IS UNDETECTABLE, PR
   ESS                                    :REM*127
2Ø PRINT"RUN/STOP-RESTORE KEYS AND RUN AGAIN."
                                          :REM*15
3Ø P=54533:A$="4Ø/8Ø KEY IS ":IF PEEK(P)=55 THEN
    PRINT A$"DOWN":END                    :REM*11
4Ø PRINT A$"UP"                           :REM*168
```

JAMES KRETCHMAR
PHILADELPHIA, PA

$5C8 TEXT INPUT LIMITER 64/128

Whether you write programs on the C-64 or the C-128, the ability to limit the amount of text typed in at a prompt is important for trapping errors. Input Control 64/128 lets you restrict the length of prompt responses entered.

The program is numbered to be used as a subroutine. Just set the value of P$ to the message to be answered. The variable NL controls the length of the user input. Change the end of line 50140 to a Return statement and you've got a great input subroutine for either the 64 or 128.

```
Ø REM INPUT LENGTH CONTROL 64/128 - STEVE BLAND
                                          :REM*35
5ØØØØ P$="ENTER INFORMATION"              :REM*189
5ØØ1Ø NL=16:DIMG$(NL)                     :REM*226
5ØØ2Ø PRINTP$"{2 SPACEs}{CTRL 9}{CTRL 6}";:FORL=
      1TONL:PRINT" ";:NEXT:PRINT"{COMD 7}{CTRL Ø
      } "                                 :REM*1Ø9
5ØØ3Ø PRINTCHR$(145)SPC(LEN(P$)+2);:C3$=""
                                          :REM*41
5ØØ4Ø FORL=ØTONL                          :REM*77
5ØØ5Ø GETG$(L):IFG$(L)=""THEN5ØØ5Ø        :REM*2Ø8
5ØØ6Ø IFG$(L)=CHR$(2Ø)ANDL=1THEN5ØØ5Ø     :REM*167
5ØØ7Ø IFG$(L)=CHR$(2Ø)THENPRINTCHR$(157)"{CTRL 9
      } {CTRL Ø}"CHR$(157);:L=L-1:GOTO5ØØ5Ø
                                          :REM*138
5ØØ8Ø IFG$(L)=CHR$(13)THENFORL1=LTONL:PRINT" ";:
      NEXTL1:L2=L-1:L=NL:GOTO5Ø12Ø        :REM*76
5ØØ9Ø IFL=NLTHENIFG$(L)=CHR$(2Ø)THENPRINTCHR$(15
      7);L=L-1:GOTO5ØØ7Ø                  :REM*2Ø9
5Ø1ØØ IFL=NLTHEN5ØØ5Ø                     :REM*134
5Ø11Ø PRINTG$(L);                         :REM*2Ø2
5Ø12Ø NEXT:PRINT                          :REM*79
5Ø13Ø FORL1=ØTOL2:C3$=C3$+G$(L1):NEXT     :REM*162
5Ø14Ø PRINT"{2 CRSR DNs}YOU ENTERED {CTRL2}";C3
      $"{COMD 7}":END:REM CHANGE TO RETURN FOR S
      UBROUTINE                           :REM*51
```

STEVE BLAND
ROMOLAND, CA

$5C9 COMMAND FLASHER 64

Here's a little routine that causes the border of the C-64's screen to flash whenever a Basic command is executed. Being able to see when commands within a program are being executed makes programs easier to debug. And Command Flasher 64 is relocatable, so programmers have the option of setting the value of K to any memory location not used by other programs.

```
Ø REM BASIC STATEMENT FLASHER 64 - REINER RICHTE
  R                                       :REM*144
1Ø K=7ØØ:FOR J=Ø TO 35:READ A:T=T+A:POKE K+J,A:N
  EXT                                     :REM*133
2Ø IF T<> 4587 THENPRINT"ERROR IN DATA...":END
                                          :REM*62
3Ø PRINT"SYS"K+1Ø"TO ACTIVATE STATEMENT FLASHER"
                                          :REM*15
4Ø PRINT"SYS"K+23"TO DE-ACTIVATE STATEMENT FLASH
  ER"                                     :REM*172
5Ø DATA 238,32,2Ø8,2Ø1,58,176,15,76,128,Ø,169,76
  ,133,124,169,188,133                    :REM*74
6Ø DATA 125,169,2,133,124,96,169,2Ø1,133,124,169
  ,58,133,125,169,176,133                 :REM*189
7Ø DATA 126,96                            :REM*67
```

REINER RICHTER
KALLISTA, AUSTRALIA

$5CA RAM CLEAR 64

RAM Clear 64 is a utility that programmers of all ability levels can use. Run this little program to create RAM Clear 64. Next, load it using the syntax LOAD "RAM CLEAR 64",8,1 and enter SYS 828. All memory from location 2048 to 53247 is wiped clean in one second! If you've filled the 64's memory with a Basic program and utilities such as *RUN*'s Checksum, the DOS Wedge, or other machine language routines, use RAM Clear 64 to clear them without turning the computer off.

```
Ø REM RAM CLEAR 64 - JAMES TINGLEY        :REM*44
1Ø OPEN8,8,8,"Ø:RAM CLEAR 64,P,W"         :REM*2Ø6
2Ø FOR T= 1 TO 54:READ B:PRINT#8,CHR$(B);:NEXT
                                          :REM*188
3Ø CLOSE8:END                             :REM*223
4Ø  DATA  6Ø,3,165,1,72,41,254,133,1,169,Ø,133,25
  1,133,55,168,162,8,134                  :REM*145
5Ø  DATA  252,134,44,145,251,2ØØ,2Ø8,251,23Ø,252,
  166,252,224,2Ø8,2Ø8,243                 :REM*93
```

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```
60 DATA 104,133,1,169,1,133,43,169,160,133,56,16
   9,0,32,66,166,76,116                    :REM*8
70 DATA 164                                :REM*159
```

JAMES S. TINGLEY
BURTONVILLE, MD

$5CB 128 KEYPAD COMMA

Nearly everyone uses the C-128's numeric keypad for entering numeric Data statements. After running this program in 128 mode, the numeric keypad's period key produces a comma, allowing speedier, one-handed data input. Use it once and you'll want to use it every time you need to enter numeric data.

```
0 REM COMMA ON NUMERIC KEYPAD - STEPHEN DIRSCHAU
  ER                                       :REM*186
10 FOR T=0 TO 88:POKE 7079+T,PEEK(64128+T):NEXT:
   POKE 7161,44:POKE 830,167:POKE 831,27 :REM*84
```

STÉPHANE DIRSCHAUER
TORONTO, ONTARIO

$5CC ML DIRECTORY 64

If this doesn't quickly become one of your most used C-64 utilities, you aren't using your computer much. Once ML Directory 64 is running, by using the syntax SYS 850 "$:*" you can call up any disk's directory in 64 mode.

You can also use question marks as wildcards for selective directories. Pressing the SHIFT key halts the scrolling of a directory, while pressing the RUN-STOP key exits the directory.

```
0 REM DIRECTORY 64 - REINER RICHTER      :REM*112
10 K=850:FOR J=0 TO 134:READ A:POKE K+J,A:T=T+A:
   NEXT                                  :REM*247
20 IF T<>17974 THEN PRINT"ERROR IN DATA...":END
                                         :REM*221
30 PRINT"SYS"K","CHR$(34)"$;*"CHR$(34)" TO VIEW
   DIRECTORY"                            :REM*97
50 DATA 32,121,0,201,44,208,120,32,115,0,201,34,
   208,113,32,115,0,201,36               :REM*100
60 DATA 208,106,169,234,133,130,133,131,166,122,
   164,123,134,7,162,254,134             :REM*48
70 DATA 2,162,0,32,115,0,232,201,0,208,248,138,1
   66,7,32,189,255,169,8,170             :REM*136
80 DATA 160,0,32,186,255,32,192,255,162,8,32,198
   ,255,160,6,208,2,160,4                :REM*183
90 DATA 170,32,207,255,136,208,249,164,144,208,3
   2,32,205,189,169,32,32,22             :REM*94
100 DATA 321,32,207,255,208,248,230,2,169,13,32,
    22,231,174,141,2,202,240             :REM*166
110 DATA 250,165,197,201,63,208,211,32,204,255,1
    69,8,32,195,255,169,240              :REM*236
120 DATA 133,130,169,239,133,131,96      :REM*198
```

REINER RICHTER

$5CD C-128 HI-RES INTERLACE MODE

This program lets you easily set the C-128's 80-column screen to a half-height, hi-res interlace mode. As on other more expensive computers, the screen does have a tendency to flicker, but it's still easy to read.

```
0 REM INTERLACED/HI-RES 80 COLUMNS - TERENCE BUR
  NS                                       :REM*19
10 A=54784:SCNCLR:PRINT"WOULD YOU LIKE (F)ULL OR
   (H)ALF SIZE SCREEN?                     :REM*15
20 PRINT"PRESS 'Q' TO QUIT"                :REM*148
30 GETKEYA$:IF A$<>"F"AND A$<>"H" AND A$<>"Q"THE
   N 10                                    :REM*216
40 IF A$="F" THEN 60                       :REM*179
45 IF A$="Q" THEN END                      :REM*181
50 POKE A,4:POKE A+1,58:POKE A,7:POKE A+1,51:POK
   E A,8:POKE A+1,255:POKE A,9:POKEA+1,234:GOTO7
   0                                       :REM*139
60 POKE A,4:POKE A+1,32:POKE A,7:POKE A+1,29:POK
   E A,8:POKE A+1,252:POKE A,9:POKE A+1,231
                                           :REM*135
70 COLOR 6,7:COLOR 5,2:GOTO 10             :REM*231
```

TERENCE BURNS
GLOUCESTER POINT, VA

$5CE IT'S A SMALL WORLD 64/128

With the following program, C-64/128 users can enjoy a reasonable facsimile of the song *It's a Small World* in either mode.

```
0 REM SMALL WORLD - FRANK LECH             :REM*47
10 PRINT"IT'S A SMALL WORLD":S=54272:FOR SW=S TO
   S+24:POKE SW,0:NEXT                     :REM*231
20 POKES+24,15:POKES+2,255:POKES+3,0:POKES+5,9:P
   OKES+6,0                                :REM*165
30 READ N1,N2,DR                           :REM*103
40 IF N1=0 THEN PRINT"THE END!":END        :REM*147
50 POKES+1,N1:POKES,N2:POKES+4,65:FORZ=1 TO DR:N
   EXT                                     :REM*56
60 POKES+4,64:GOTO30                       :REM*144
70 DATA 20,169,250,21,227,250,24,146,500,41,83,5
   00,32,204,500,36,208                    :REM*1
80 DATA 250,32,204,250,32,204,500,30,245,500,30,
   245,500,18,104,250,20                   :REM*30
90 DATA 169,250,21,227,500,36,208,500,30,245,500
   ,32,204,250,30,245,250                  :REM*178
100 DATA 27,148,500,24,146,500,24,146,500,20,169
    ,250,21,227,250,24,146                 :REM*246
110 DATA 500,32,204,250,36,208,250,41,83,500,36,
    208,250,32,204,250,27                  :REM*102
120 DATA 148,500,36,208,250,41,83,250,43,200,500
    ,41,83,250,36,208,250,24               :REM*139
130 DATA 146,500,43,200,500,41,83,500,36,208,500
    ,32,204,150,32,204,750                 :REM*228
140 DATA 32,204,250,41,83,500,43,200,500,36,208,
    500,36,208,250,36,208                  :REM*169
150 DATA 1000,36,208,750,36,208,250,41,83,500,36
    ,208,500,41,83,750,41,83               :REM*116
160 DATA 250,41,83,1000,41,83,750,41,83,250,49,1
    62,500,41,83,500,43,200                :REM*2
170 DATA 750,43,200,250,43,200,500,41,83,250,36,
    208,250,24,146,1000,30                 :REM*226
180 DATA 245,1000,32,204,1500,0,0,0        :REM*4
```

FRANK LECH
CHICAGO, IL ■

Send your Magic tricks to Magic, RUN *Magazine, 80 Elm St., Peterborough, NH 03458. We pay $10–$40 for each one used.*

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News and New Products

Commodore has a new C-64 support program, and 8-bitters have two new printers to check out.

By JANICE GREAVES

More Support for the C-64

WEST CHESTER, PA—Contrary to some nasty rumors, the 64 has not been discontinued. Actually, Commodore recently enhanced their C-64 support. With the **64 For $64** program, you can send Commodore any broken C-64, along with $64, and they will send you a refurbished C-64, complete with a 60-day warranty. (If your C-64 is still under its original warranty, of course, your repairs and shipping are covered under the Commodore Express program.)

CBM has also reinstated their **Education Purchase Plan**, which offers large discounts (up to 40 percent) to students and educational institutions on anything they manufacture. Call 800-66-AMIGA to locate a dealer near you.

And finally, Commodore has increased its **Commodore Express** support to include all Commodore computers, even the 128. For information, call Commodore Express at 800-448-9987.

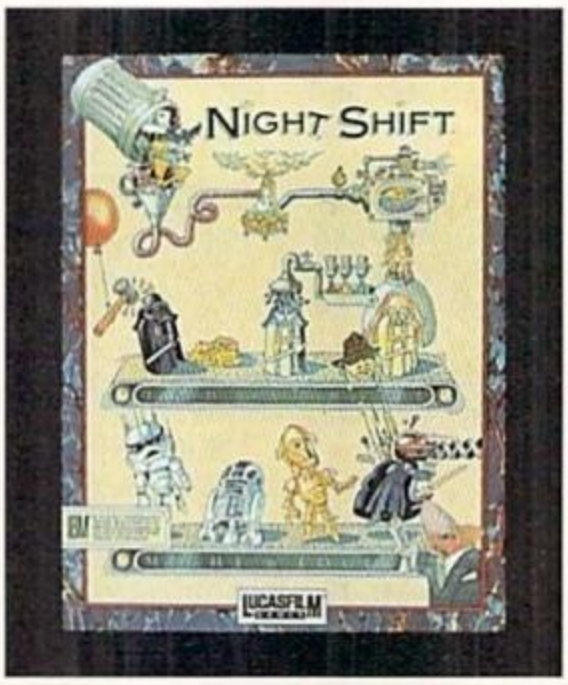
MIDI Madness

PEORIA, IL—The Computer Music Coalition has released their first issue of ***Ear Candy***, a magazine/catalog of computer-produced music. The glossy 32-page book is published bimonthly and sells for $5 per year. (Sample issues are $1.) The book describes, reviews and sells musical recordings from artists of various styles. Many of these recordings were produced on C-64s.

Each year the coalition will award artists in various categories the Ear Candy Award of Excellence. And for every work sold through the magazine, Ear Candy will donate 10 cents to the Coalition's scholarship fund for aspiring musicians. For additional information, write to the Computer Music Coalition, 1024 W. Willcox Ave., Peoria, IL 61604.

Those Wacky Guys at Lucasfilms

SAN RAFAEL, CA—Commodore gamers have something new to try: Night Shift from Lucasfilm Games. Placed in a zany toy factory, this game combines simulation, strategy and action, and features over 30 levels of play. The first levels are designed to be easy enough for beginners, while the upper levels are intended to challenge even the most advanced players.



Keeping the Beast running is a challenge in Night Shift from Lucasfilm Games.

The toy factory transforms industrial waste into plastic resin that's cast into the heads and bodies of toy Lucasfilm characters. The process is simple, but nothing works according to plan: Electricity fails, toy heads and bodies get mixed up, paint dryers break, and nasty lemmings interfere whenever they can. To sign up for the Night Shift, at $29.95, call Electronic Arts, 800-245-4525.

Timeworks' Tech Support

DEERFIELD, IL—Timeworks, the publisher of Word Writer V, has revamped its technical support program to include three levels of support.

First, all registered owners of Timeworks software can call 708-559-1331 during the business day. For help after-hours, at a charge of $2 per minute, call 900-329-3292.

This new program also offers a premium support option that includes, at a charge of $30 per year, daytime access to an 800 number and a 30- to 40- percent discount on all products, in addition to any other discount or premium.

The Magic Fax

ROCKVILLE, MD—GEnie online service users can now send faxes anywhere in the world. The new service, called **Mail to Fax**, lets GEnie users send messages to fax machines, whether the recipient is a GEnie subscriber or not. To send a message, all the GEnie user needs to know is the fax machine's complete phone number. If for some reason the fax is not delivered, the sender is notified by electronic mail.

Seikosha Has Nine-Pins . . .

MAHWAH, NJ—Seikosha recently released the **Prienté 900**, a 9-pin impact dot matrix printer with IBM Proprinter II and Epson FX-850 emulation. It has stored-energy printheads for quiet, reliable printing. The Prienté offers paper parking, which backs fanfold paper out of the way while you use single sheets, then returns the fanfold to its proper position. Other features include auto-loading, and friction and push tractor feeds.

The Prienté prints 192 characters per second (cps) in Draft mode and 48 cps in NLQ mode. It offers pica, elite, condensed and proportional pitch (with or without justification). The Prienté prints bold, italic, double-width, double-height, sub- and superscript characters, and over- and underscores text. It comes with a Centronics parallel interface and a built-in 1K print buffer; an 8K RAM buffer is also available. This printer is sold for $329 by Seikosha America, Inc., 10 Industrial Ave., Mahwah, NJ 07430.

. . . And Panasonic Has 24

SECAUCUS, NJ—Panasonic has an affordable new 24-pin dot matrix printer, the **KX-P1123**. The new printer offers three draft fonts, four letter-quality (LQ) fonts (Courier, Prestige, Bold PS and Script), and an easy-access operation panel for selecting font, pitch, text enhancements, form length, lines per inch, micro line feed, margins, and Quiet mode.

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The KX-P1123 can print 240 cps in Draft mode and 63 cps in LQ mode, and produces graphics at a resolution of 360 × 360 dots per inch. The printer has multiple paper paths, which let you feed paper through the top, bottom, or rear of the machine. It also has an adjustable push/pull tractor and paper parking.

The KX-P1123 has a 10K expandable buffer and a Centronics parallel interface (RS-232C serial interface optional). It can emulate the IBM Proprinter X24 and the Epson LQ-850. The suggested retail price is $399. To order, contact Panasonic at 800-742-8086.

Books . . . Easy?

IOWA PARK, TX—Easy Books Distributing has released a software package for managing your home budget or small cash-basis business. **Easy Books 1** was written to fill the void between spreadsheets and more expensive accounting packages, and is intended to be easy and useful for both new and veteran users. It features trailing zeros, year-to-date projections, a balance sheet (net worth statement), special expense categories for child care and self-employment tax, and many changeable preprogrammed categories. Request free information by calling 817-592-4727. The package sells for $34.95.

The Oscars of Software

WASHINGTON, D.C.—Every year, the Software Publishers Association selects a few outstanding new packages to receive their Excellence in Software Awards. This year, winners included the popular software star Carmen Sandiego. **Where in the World Is Carmen Sandiego** took the prize for Best Home Learning Program. Hats off to Carmen and her creators at Broderbund Software.

Control the Stars

SAN JOSE, CA—Accolade has just released **Star Control** for the Commodore 64 and 128 computers. This new game of galactic conquest from Paul Reiche and Fred Ford combines strategy and arcade action.

For straight action gamers, Melee mode lets you bypass the detailed planning of strategic play, sending you straight into the thick of the battle. In Full Game mode, you build your fleet by colonizing and mining the star systems. The more Starbucks you earn, the more powerful your fleet will be. Throughout, you face enemies and make strategic decisions, until finall, you face the ultimate battle for freedom in the galaxy. Each of the eight starships has different handling characteristics, special powers, unique

Star Control features action and strategy.

sound effects and one secret weapon. Star Control is available for $39.95 from Accolade, 550 Winchester Boulevard, San Jose, CA 95128.

Monet on the 64

PATCHOGUE, NY—Art Instruction Software has just released **Principles of Composition**, a software package that teaches basic principles of artistic design and composition, such as balance, color, rhythm, pattern and contrast. The program features graphics lessons and a self-administered examination.

As a final project, you're asked to use all of the principles learned throughout the course to create an original painting, using the paint program included. When you've completed the course successfully, the company will send you a certificate documenting your accomplishment. All instruction is included on the disk; no manuals are needed. The program sells for $42.95 and has a 30-day warranty. To order, write to Art Instruction Software, PO Box 1352, Patchogue, NY 11772.

Get Certified

WHEELING, IL—From Micro Format, Inc., comes **LA-SERtificate**, certificate paper for laser printers. Each package contains 50 sheets of 8½ × 11-inch certificate paper on 20 pound recycled/recyclable laser bond. When trimmed, LA-SERtificate will fit properly into an 8 × 10 frame. Four traditional border designs and colors are available.

LA-SERtificate can be used with various software packages, including Broderbund's Print Shop, Certificate Maker by Springboard and the Award Maker line by Baudville. A 50-sheet package of LA-SERtificate is $9.95. For details, contact Micro Format, 533 North Wolf Road, Wheeling, IL 60090.

Productivity Plus

DRAPER, UT—NewSpeak Software has three new titles for the C-64.

Graphics Importer is a conversion program for GEOS that converts C-64 graphics into geoPaint or photo scrap format. The program supports many popular formats, including Doodle!, Koala Pad, Print Shop, Art Studio and several non-Commodore formats. The program will enlarge or reduce, overlay graphics and create large photo scraps for geoPublish. Graphics Importer sells for $19.95

Also from NewSpeak is **geoTheo**, a concise thesaurus for GEOS offering more than 10,000 cross referenced synonyms accessible from within any GEOS application that supports desk accessories. It features a simple interface; full Cut, Paste and Search options; and it can be used with single drive systems. It sells for $14.95.

InPrint is a collection of printer drivers for GEOS. The InPrint collection contains enhanced printer drivers for over 25 dot matrix printers, offering double-strike print, interpolation and variable print densities. Options vary among printers. InPrint is $9.95.

For information about any of these products, write to NewSpeak Software, Box 708, Draper, UT 84020.

Attention Inventors!

LAUREL, MD—Compete for hundreds of prizes, including a grand prize of $10,000. Johns Hopkins University is looking for ideas, systems, devices and computer programs designed to help the 25 million Americans with disabilities. A similar search was conducted ten years ago, and received more than 8000 entries. It resulted in hundreds of inventions, many of which have become standard equipment for people with disabilities.

This year's search is open to all residents of the United States—computing professionals and amateurs alike. Entries may address any physical, mental or learning disability. The entry deadline is August 23.

For details, write to **Computing to Assist Persons with Disabilities**, Johns Hopkins National Search, PO Box 1200, Laurel, MD 20723. ■

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MAIL RUN

This time RUN readers request "golden oldies," sing the praises of BBSs and ask which REU to buy.

ENCORE! ENCORE!

When the C-64 first came out, there were many games published by major software manufacturers. Games by Epyx, Broderbund, Sierra On-Line, and others were of very high quality. Although these companies have discontinued their C-64 lines, there are still lots of C-64 users who would purchase them. Could you please re-release all those great programs?

—ANDREW S.
ROSEMEAD, CA

At least a half-dozen companies we know of are rebundling their software "classics" and creating some very attractive deals. Popular hits we paid $20 for are now available at amazingly low prices, either individually or bundled with other software. Check your favorite software source. Now's the time to buy!

—EDITORS

HEY, KERVIN

Please tell Kervin Rene from St. Croix (Mail RUN, Jan/Feb 1991) that there's an excellent Commodore repair center in Puerto Rico, quite close to him. It is the Microcomputer Store, Reparto Metropolitano Shopping Center, Americo Miranda Ave., Rio Piedras, PR 00936; 809-754-7475 or 754-0670.

—DR. SYLVIA NEGRON DE PAYNE
CAPARRA HEIGHTS, PUERTO RICO

AN INTERNATIONAL PERSPECTIVE

It was a big pleasure to discover that 8-bit machines are still popular in the United States. I came here two-and-a-half years ago from Poland through my research work with the National Institutes of Health. I am, like many others in my country, a Commodore fan.

In Poland, 8-bit computers are extremely popular. Of course, the C-64 and 128 aren't the only popular 8-bits. There are also Amstrad/Schneider, Atari and Sinclair Spectrum machines, which are almost unknown here.

The system I own is kind of primitive, but I enjoy it and for my home purposes it's good enough. I have a 64C , a 1541C drive, a monochrome monitor and a 1351 mouse. I use a broad variety of software, but mainly GEOS. Using geoPaint I've created many graphs and illustrations for my work in the medical sciences. Recently I extended my system with a Star NX 1000 printer—I would have to pay at least two times more for this printer back in Poland.

Now for the questions: I'd like to expand the RAM of my 64C with an REU. Which one should I buy?

Also, since I bought most of my system in Austria, the manuals for the machine and GEOS are in German. I easily figured out how to use geoWrite and geoPaint, but there is no way that I can use geoCalc and geoFile—my German is too poor. How can I get the manuals in English?

—DR. I. J. POLAKOWSKI
MADISON, WI

Your question about the manuals is the easier of the two, so we'll answer it first. Replacement manuals for GEOS software are $15. To order them, call Berkeley Softworks at 415-644-0926. The manual for your computer will cost you about $10. Call Commodore Express at 800-448-9987 for details about ordering.

RUN *has received many letters asking about REUs, their functions, and their features, so bear with us as we digress a bit from your question. These peripherals, which plug into the computer's expansion port, provide additional RAM and are especially useful for data file storage with productivity software designed to work with an REU. Software that will work with REUs includes the Pocket 2 series, Fleet System 4, PaperClip III, Fontmaster 128, Write Stuff, Maverick, Basic 8, News Maker 128 and GEOS.*

There are several kinds of REUs:

- *The 1764 adds 256K to a C-64 and comes with a necessary heavy-duty power supply.*
- *The 1700 and 1750 are for the C-128 only and add 128K and 512K RAM, respectively. (The 1750 has been in short supply, but you can get a 1750 clone that can be used with both the 64 and 128. 64 users need an additional heavy-duty power supply.)*
- *geoRAM is a 512K expansion unit with a smaller price, but is designed to work solely in the GEOS environment.*

These products are all available through the mail-order houses that advertise in RUN.

—EDITORS

CLINIC CURE

In the March/April 1991 Commodore Clinic, Ellen Rule told a reader who had accidentally copied two data files to a GEOS "Master Disk" to copy them to the back page and ignore them, or to get the "Erase Header" program from Q-Link. Another simpler answer (found in the GEOS manual) is to drag an unwanted file to the border, then either drag the ghost icon into the trashcan or use the Delete option in the File menu.

—JACK FOLLOWAY, JR.
HUMBLE, TX

APPLES AND...ORANGES

I believe that many Commodore computer owners would benefit greatly from chip upgrade products similar to those produced for the Apple II by Zip Technology and Bits & Pieces Technology. Zip makes a turbo processor called Zip Chip, which allows the Apple II to process information at 8 MHz and costs under $200. Bits & Pieces makes Rocket Chip, which boosts the Apple II to 10 MHz and is also less than $200.

However, these companies seem to feel that such products would not succeed in the Commodore market. To this, I point out two successes: Schnedler Systems currently produces the Turbo Master CPU, a cartridge-based turbo processor for the 64 that retails for $199. (A review of Turbo Master appeared in *RUN*'s May/June 1991 Hardware Gallery.) Further, Creative Micro Design has had great success with their JiffyDOS ROM replacement. Creative has sold thousands of these units ($60–$70), which not only require the replacement of the computer's ROM chip, but also the disk drive's ROM.

In short, the Commodore market will pay for speed, and we're willing to replace a few chips to get it.

Being a respected voice in the Commodore community, your help could

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bring the response that we need to get products like this developed.

—Raymond Callahan
Ottawa, Ontario, Canada

We'd also like to see these products developed for the C-64/128. The above-mentioned companies can be contacted at: Zip Technology, Inc., 5601 West Slauson Ave., Suite 190, Culver City, CA 90230; 213-337-1734; and Bits & Pieces Technology, Inc., 31332 Via Colinas, Suite 110, Westlake Village, CA 91362; 818-706-7932.

—Editors

Interface Help

I have a C-128D and a KXP1180 Panasonic Printer. I'm looking for an interface without DIP switches, that I can just plug in and use. I had a Super Graphics Jr. and had problems setting the switches for my software.

—Cindy Remiszewski
Greenfield, WI

Setting DIP switches is a unique torture that would have been best left to Dante's Computer Inferno. One of the few printer interfaces ever offered without DIP switches was the PPI With Graphics by D.S.I., released in 1985. However, that interface is no longer available through the sources we know of.

Fortunately, DIP switches need to be set only once, and once set, they're easy to use and serve a useful purpose. We all have trouble with them, and always end up setting them by trial and error. Contact a user's group (see the list in the May/June 1991 RUN*) if you need individual help getting them set. Just remember to write the settings down in your printer manual when you've gotten them right!*

—Editors

BBS Booster

BBSs are an oft-overlooked resource. They are free, and meet the needs of local users. Many have areas for technical questions and are manned by a local user's group. Most have areas for discussing programming, public domain programs, commercial software and hardware reviews and general discussions covering hobbies, politics, music, you name it.

—Gary Noakes
Landover, MD

Form Writer

My C-128 organizes my finances, does my correspondence, prints posters and educates my children and pupils. Would you believe I'm now finishing a master's thesis done entirely on the C-128?

In spite of all that, there's one thing I see PCs and Macs do that I can't: create forms. Is there a C-128 program that will create forms? I need to print different type sizes, show darkened areas, and draw thin and thick horizontal and vertical lines. This is the type of program we Commodore users need more of! You will no doubt agree, there are quite enough games already.

—Elroy Grandy
Garnish, Newfoundland

We couldn't find commercial software that would do what you describe, but RUN *has a program called Form Writer 64 and 128. Though it doesn't have the graphics flexibility you want, it does have a database so you not only create forms, but also store data from the forms you create. Form Writer is one of the programs on the RUN Works Disk ($24.97). For information, call 800-441-4403.*

A graphically flexible forms-creation program would be a nice addition to our collection. Has anybody out there written one?

—Editors ■

Whether you have a user's group to add, a BBS to plug, a question to ask or a suggestion to make, Mail RUN is your forum. Send your letters to MailRUN, RUN *Magazine, 80 Elm St., Peterborough, NH 03458.*

User's Group Update

No sooner had we published a "complete" list of user's groups than we started getting a flurry of letters from clubs we didn't know about. Here are some additions:

Commodore Mobile User's Group
PO Box 9524
Mobile, AL 36691

Program Commodore Computer Club
PO Box 6000
Fort Smith, AR 72906

McHenry County Commodore Computer Club
c/o John B. Katkus
227 East Terra Cotta Ave.
Crystal Lake, IL 60014

QCCCC
PO Box 3994
Davenport, IA 52808

WICOMICO Commodore User's Group
c/o 11423 Back Creek Road
Bishopville, MD 21813

Traverse Area Commodore Club
PO Box 1
Rodney, MI 49342
(Meetings are held in Traverse City.)

Commodore User's Group of Kansas City
PO Box 36834
Kansas City, MO 64111

HUG-64
PO Box 632
Findlay, OH 45839

Philadelphia Area Computer Society
c/o LaSalle University
Philadelphia, PA 19141

Chattanooga Commodore User's Group, Inc.
PO Box 271
Bryant, AL 35958
(This group meets in Tennessee.)

The Final Horizon
1409 Mill St.
Laramie, WY 82070

User's Group News

I'm starting a mail-in user's group, and I need to know what type of group *RUN* readers would like. To get our questionnaire, write to:

New Users
3013 S.W. 11th St.
Ft. Lauderdale, FL 33312.

—Ulices Diaz
Ft. Lauderdale, FL

The North American Commodore User's Group Association (NACUGA) is a relatively new organization serving over 50 user's groups in several countries. Individuals and groups interested in joining us can write to:

NACUGA
Box 2984, Stn. A
Moncton, NB E1C 8T8
Canada

—Dave Quinn
Coordinator, NACUGA
Moncton, New Brunswick

Watch Mail RUN in September for more user's group listings!

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NEW!

ACTION REPLAY v5.0

THE ULTIMATE UTILITY / BACKUP CARTRIDGE FOR THE C64/128

• Action Replay allows you to Freeze the action of any Memory Resident Program and make a complete back-up to disk - and that's not all ... Just compare these features.

SUPER CRUNCHER — ONLY $9.99

- A utility to turn your Action Replay 5 into a super powerful program compactor. Reduce programs by up to 50%! Further compact programs already cruched by AR5's compactor.

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To take advantage of AR5's unique power, we have prepared a suite of graphic support facilities.

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The world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.

- No special formats — with action replay you simply save directly into Warp 25 status.
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- Warp Save/Load Available straight from Basic.

RAMLOADER

- You can also load load most of your commercial originals 25 times faster! With our special LSI logic processor and 8K of onboard Ram, Action Replay offers the world's fastest Disk Serial Turbo.

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- Because of Action Replay's on Board Ram the program can be looked at in its ENTIRETY. That means you see the code in its Frozen state not in a Reset state as with competitors products.

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- Sprite Monitor: View the Sprite set from the frozen program — save the Sprite — transfer the Sprite from one game to another. Wipe out Sprites, view the animation on screen. Create custom programs.
- Sprite Killer: Effective on most programs — make yourself invincible. Disable Sprite/Sprite/Background collisions.
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing paddles format.
- Compactor: Efficient compacting techniques — 3 programs per disk — 6 if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: Many additional commands: Autonum, Append, Old, Delete, Linesaver, etc.
- Screen Dump: Print out any screen in 16 Gray Scales, Double size print options.
- Unstoppable Reset: Reset button to Retrieve System and Reset even so called Unstoppable Programs.
- Fully Compatible: Works with 1541/C/II, 1581, 1571 and with C64, 128, or 128D (in 64 Mode).
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys.
- Unique Restart: Remember all of these utilities are available at one time from an intergrated operating system. A running program can be Frozen to enter any Utility and the program is restarted at the touch of a key — without corruption.
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THE MOST POWERFULL DISK NIBBLER AVAILABLE ANYWHERE AT ANY PRICE!

-Burst Nibbler is actually a two part system - a software package and a parallel cable to connect a 1541 or 1571 to a C-64 or C-128
-What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial port bus - when non-standard data are encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it, so you get a perfect copy of the original.
-Will nibble up to 41 tracks -Copy a whole disk in under 2 min -Installs in minutes - no soldering required on 1541 (1571 requires soldering)

SOFTWARE ALONE - ONLY $19.99 -- CABLE ALONE - ONLY $19.99

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MIDI CABLES (5 ft. prof. quality) -Only $*8.99

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- Generate almost unlimited sounds with the flexible **SYNTHESIZER** module

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- Windows can be inverted, cut & pasted, enlarged, reduced, squashed, stretched, flipped and rotated
- Solid & textured fill option, with 32 user definable patterns
- 3 levels of magnification with pan & zoom, pixel clear and plot
- Text - 9 character sizes, 2 directions, bold and rotate
- Comprehensive font editor
- Lines, points, rectangles, triangles, circles and rays
- Undo facility for last operation

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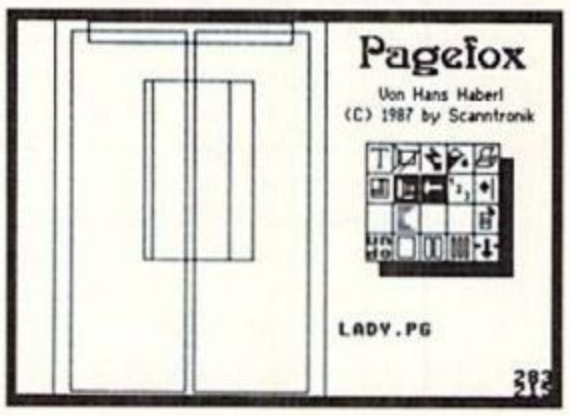

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SOFTWARE GALLERY

This time we have reviews of exceptional entertainment and productivity software including DragonStrike, Ultima VI, B.A.T. and Back to the Future II.

By WALT LATOCHA

ULTIMA VI: THE FALSE PROPHET.....A–

Aficionados & First-Timers Will Enjoy This New Trip to Britannia

Avatar, prepare yourself! Lord British's fair realm once again faces a most dreadful catastrophe, and you must come to the rescue in Ultima VI: The False Prophet.

The game comes on three floppy disks accompanied by a small "Orb of the Moon" gemstone and a cloth tapestry map of Britannia. The new menace is a massive invasion of Gargoyles, mighty creatures that have begun to seize holy shrines. Your mission is to find out what the Gargoyles want and then to free the land from their presence.

You begin by answering a gypsy's questions, to determine the attributes and abilities of the main character you control. Then you go on to assemble a band of comrades to accompany the character. Everyone in the party earns experience points as the mission progresses.

Casting spells, engaging in extensive combat, conversing with various characters, travelling through moongates, and trading equipment are all features of play. Of course, most of your time will be spent exploring the surface and dungeons of the game's fantasy world.

Ultima VI suffers from a technical problem that could affect some players. The documentation indicates that you can and should make disk copies, which then let you save more than one game position at a time. It also states that "Any copy program will do," but a call to Origin revealed that duplicate disks may not work unless they're produced with a "nibbler" program that makes multiple passes over the original disks.

Despite this shortcoming, Ultima VI is a high-quality game. The music during some game segments is excellent, and the graphics are almost as good. What's more, the control system, which can accept input from a joystick as well as the keyboard, is quite friendly.

This program's system of magic is much less intricate than that of previous

Ultima VI creates a world rich in exotic locations and intriguing puzzles.

Ultimas. As a result, it should be the most accessible role-playing program for novice gamers that Origin has yet produced. This is not to say that it will be easy to master, however; the quest will still take scores of hours to successfully complete.

The greatest strength of the software lies in the richness of the world it creates. There are exotic locations to explore, intriguing puzzles to solve and an unbelievable number of heroic actions to perform. And Origin has done a fantastic job of linking it all to the mythos that was created in the previous Britannia games.

Role-playing aficionados will enjoy Ultima VI: The False Prophet. With it, you get more than a computer game: You get an entire universe.

(Origin Systems, Inc., 110 Wild Basin Road, Suite 330, Austin, TX 78746. C-64/$69.95. If you order Ultima VI directly from Origin, you'll receive a free audio cassette in which Lord British discusses the Ultima series. A clue book is available for $12.95.)

REPORT CARD

A Outstanding

B Very Good

C Average

D Below Average

F Crummy

BACK TO THE FUTURE II .....A–

An Almost Perfect Return-Trip to Hill Valley

Konami's Back to the Future II comes with a premium—a copy of the cap that time-traveler Marty McFly wore in the movie. Software publishers have been known to offer such free gifts to make up for deficiencies in their products, but that definitely isn't the case with this well-made program.

During a game session, you use a joystick to guide characters from the film through five levels of play. The first takes place in 2015, when you fly on a hoverboard to Hill Valley's town hall and try to prevent the arrest of Marty's son. Within a set time limit, you must overcome Griff's evil gang and collect boosters that increase your speed and restore your energy after battles and collisions.

Finishing this arcade sequence brings you to the second scenario, a logic puzzle. Jennifer, Marty's girlfriend, finds herself in the house where she'll live in 2015, and if she meets any of its occupants, the fabric of time will unravel. You open two of the house's doors at a time in an attempt to get her out safely. However, unless you plan ahead, your actions will make one of the people from the future emerge from the wrong room and accidentally bump into Jennifer.

Scenario three takes place in Hill Valley during 1985. There Marty discovers that Biff, Griff's grandfather, secretly brought back an almanac from 2015 and changed the course of time. Marty must use martial arts to get past thugs armed with frisbees, rocks and other weapons. Success brings the young time-voyager to his DeLorean.

Then it's on to scenario four, which is set in 1955. This is another logic test, and is similar to those puzzles where you rearrange sliding tiles into a picture. Your goal is to end up with an animated ►

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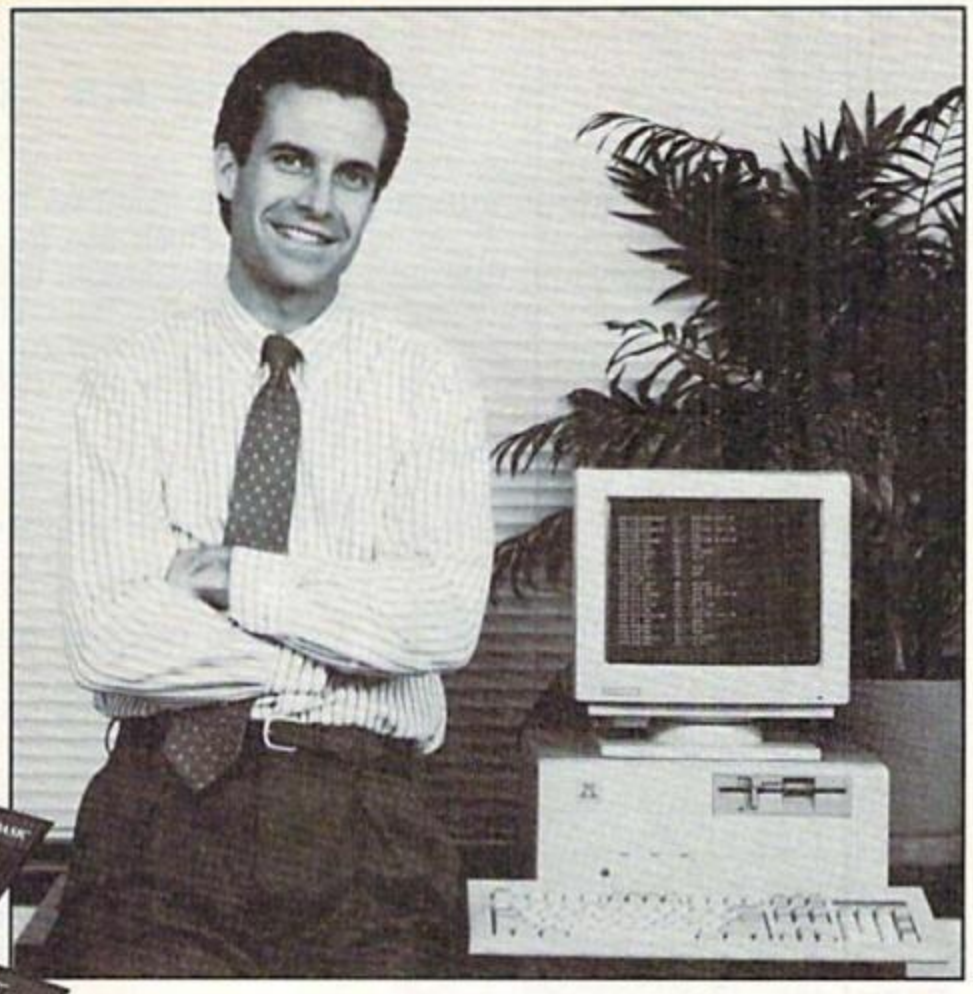

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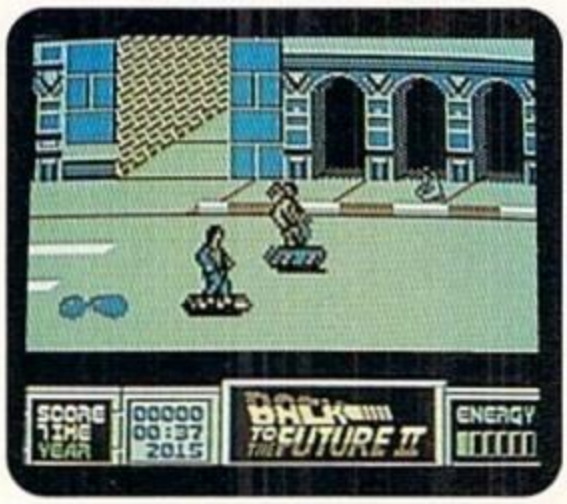
scene from the movie's Enchantment Under the Sea dance.

The final scenario has Marty, still in the past, chasing Biff on the hoverboard. This scene is similar to the first, but now you have to snatch the almanac to successfully conclude the game.

Unfortunately, this game is based on what is generally considered to be the least inspired and most confusing part of the *Back to the Future* film trilogy. Another



In Back to the Future II, tactical elements add challenge to the action sequences.

problem is obsolescence—*Back to the Future III*, with the trilogy's widely acclaimed finale, has already hit theaters and video stores.

Still, this game has much to recommend it. The graphics and sound are outstanding, the control system is fluid and responsive, and careful planning is evident in the story line's execution. Especially welcome are the tactical elements that add mental challenge to the arcade sequences.

Back to the Future II is so finely constructed, it would be almost perfect if modeled after a more impressive source. To wit, may I suggest that Konami consider Back to the Future III as an upcoming project. *(Konami Inc., 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510. C-64/$29.95)*

B.A.T.....A

Great Sci-Fi Adventure with Excellent Graphics and Control

B.A.T. is appealing on a number of levels. Science fiction fans will enjoy its story line, which brings to mind novels by James Blish, Isaac Asimov and William Gibson. Then it skillfully blends elements of simulation, role-play and graphics adventure. Finally, its arcade sequences should please fans of fast action.

The title of the two-disk program stands for "Bureau of Astral Troubleshooters." As a B.A.T. agent, you must eliminate a horrendous terrorist threat to the planet Selenia.

Unless you wish to use the character as is, your first task is choosing the relative importance of the agent's modifiable competences, such as intelligence, charisma and vitality. Based on your selection and on the program's parameters, the agent receives marksmanship, lock-picking and other abilities. Then you pick armament from a list of six futuristic weapons.

Aiding your quest is B.O.B., a Bidirectional Organic Bioputer that's implanted in every agent's arm. This device reveals important data, such as the character's experience and health status. B.O.B. also translates alien speech, and you can program it to automatically perform tasks such as speeding up bodily functions during battles.

During a game, the agent explores an alien planet, pilots an exotic flying machine, and talks to a variety of bizarre creatures. He even gets to indulge in a little romance, and a love meter is included to evaluate his performance.

Artwork and a menu-based control system make B.A.T. an outstanding adventure.

Although it has few sound effects, the program does have exceptional graphics—the best I've seen on a C-64. And by using the % option on Epyx's Fast Load cartridge, you can see this artwork without suffering excessively long waits for disk access.

Even more noteworthy than the superb artwork is the menu-based control system. Options are selected via cursors that change shape as they pass over different sections of the screen. The inter- ►

YOURS, MINE AND OURS!!....A

Finally, Some Good *News About Your Finances*

There was an odd note attached to my Illinois tax forms this year. A state official wrote that he hoped I "liked" the schedules as much as he did. I suppose he was joking, since nobody can possibly "like" a tax form.

Fortunately, C-64 software is available that makes preparing these forms more tolerable. One such program is Xytec's Yours, Mine & Ours!! (YMO), which can help with onerous yearly tax chores, and do much more as well.

The program targets families, couples, groups, roommates and home businesses. It will recognize up to six users and protect their data with passwords. And it comes on a single non-copy-protected disk.

As with most accounting systems of its type, the heart of YMO is its ability to track income and expenses. You can organize your entries under these categories in practically any manner you choose. Both split transactions and monthly and yearly closings are allowed. It also lets you set up relationships. Using this impressive feature, income and expenses can be apportioned on a percentage basis among as many as 24 individuals or groups.

You can produce a variety of monthly and annual reports for tax and other purposes. A calculator and graphmaker are included, and options on the disk assure compatibility with a wide range of printers. YMO will write checks, and will reconcile credit card statements and balance checkbooks.

All these features, and others, are supported by an easy-to-use, menu-driven interface and a 191-page manual, which does a thorough job of explaining the program. As a further inducement to potential purchasers, Xytec currently allows a ten-day examination of the accounting system at no charge. However, you should contact the company if you wish to take advantage of this offer, since it may be withdrawn at any time.

Learning to use this software takes a significant effort, but only because it has so much to offer. I would certainly recommend Yours, Mine & Ours!! to anyone who needs help with taxes, budgeting, record keeping or other financial tasks. *(Xytec, 1924 Divisadero, San Francisco, CA 94115. C-64/$49.95)*

—Walt Latocha

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face is extremely user-friendly and gives a sense of great power, as the mere press of a joystick button makes entirely new scenes quickly materialize.

B.A.T. has many features and they are well presented. It's a must-buy if you're even remotely interested in extraterrestrial exploits.

(UBI Soft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95)

DragonStrike .....A+

Fly Scaly Fire-Breathing Steeds In Outstanding Aerial Action

Take note, role-players. The Advanced Dungeons & Dragons logo on the packaging of DragonStrike may lead you to believe that it's another of SSI's fantasy quests. However, this game is actually a combat flight simulator, and an outstanding one at that.

The package contains a handsomely illustrated manual and reference cards with splendid pictures of battle scenes. The program isn't copy-protected, and you can save five game positions on each of the duplicate disks you make. Control is either keyboard-only or a joystick/keyboard combination.

The game takes place during the War of the Lance in the world of Krynn. The vile Queen Takhisis has created evil dragons to spearhead her ruthless invasion. As a heroic fighter, you must climb atop good dragons and fly off to save the land.

Though you begin as a lowly squire of the Knights of the Crown, successfully completing combat missions could ultimately make you Lord Warrior of the order. Or, if you desire, you can switch to either the Knights of the Sword or the Knights of the Rose and strive for their highest ranks.

Your first mount is a Bronze dragon named Sirdar. As the game advances, you enter battles on progressively more powerful animals, ending with Theo, a legendary Gold dragon. However, the strength of your opponents also increases in later missions.

All of your reptilian steeds have two breath weapons, such as chlorine gas and lightning bolts. After using one of them, your dragon must recharge the weapon before attacking again. Meanwhile, you must avoid attacks from your opponents, who have similar offensive capabilities. You're armed with a sword and a dragon lance, which can be pointed in the direction of an anticipated attack.

Other game features include a compass, a height/pitch indicator, healing ointments, a crystal ball that shows the relative positions of you and your enemies, and read-outs of breath, power and speed levels. The program also offers helpful magical devices that you can earn during battles.

This software excels on every level. The graphics are sharp and colorful, the animation is fluid, and the controls nicely support the missions you undertake. The story line is well developed both in the documentation and on the screen. And you quickly become immersed in the fascinating world of Krynn, where thought and action are blended to offer an intriguing challenge.

With DragonStrike, SSI has created a unique and exciting game experience. It is an original concept and is superbly executed.

(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95)

Bill & Ted's Excellent Adventure .....D

This Time Bill & Ted Nearly Flunk the Exam

One of 1989's biggest cinema surprises was the phenomenal success of *Bill & Ted's Excellent Adventure*. However, Capstone's translation of the film into a C-64 game is a major disappointment, proving once again that success in one entertainment medium does not automatically transfer to another.

The program is part arcade contest and part adventure, with a wacky plot that loosely follows the movie's story line. The title characters, whom you control with a joystick, face failure in history class unless they ace the final. Coming to their rescue is Rufus, a voyager from the future who brings the boys a time-traveling telephone booth.

Though Bill and Ted visit some "Bodacious" places, the game is less than "Excellent."

With it, they journey through the past, trying to snatch either six or twelve famous "dudes," such as Socrates and Joan of Arc (yes, there are female dudes). Grabbing the correct number of historical figures and bringing them to 1991 results in a stellar class presentation and an A+ in the course.

To succeed, you must do well in arcade sequences, both to find the characters and to locate objects that will lure them into the booth. Speed is essential in meeting the program's time limits.

Unfortunately, the program is plagued by a number of shortcomings. For instance, although the instruction manual claims that the sound is "bodacious," there are long periods of silence and very little music. The control system is ►

Questmaster .....D

Beware the Cute Package

Your biggest problem in this picture-text adventure is all the extra help that your antagonist, Colnar, gets from the game designers! Questmaster imposes unfair time limits in nearly all critical situations and seems to delight in killing off the player, usually without warning. Spend too much time exploring a wall, for example, and the chamber will seal, the room will fill with water, and you'll be history. Fail to use a vial (unlabeled) of invisibility potion and the Wildebeest (hidden around the bend) will do you in.

At each fatal experience, you lose points and time to restore the game.

This, plus the necessary delays for game saves, the time pressure you face when tackling puzzles, text that scrolls by too fast, the buzzing noise often used as a prompt, and the fact that East is to your left as you face North, all adds up to very punishing game play. Once you're past the nicely illustrated manual and into the potentially engaging scenario, expect six disk sides of nonstop torture. (*Miles Computing, 5115 Douglas Fir Road, Suite 1, Calabasas, CA 91302. C-64/$34.95*)

—Jeff Hurlburt
Houston, TX

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balky at times. And, because the program is not compatible with Epyx's Fast Load cartridge, you can wait more than three-and-a-half minutes before play begins. In addition, the positioning of characters on the screen can be rather bizarre; for example, in one scene I had Bill and Ted apparently walking on water (one of the few things they're *not* supposed to do).

A much more serious problem popped up when I searched for Napoleon. The game always froze completely when I entered this part of the program. I got the same result when I tried a new game package. This is an unacceptable bug, since you must nab Napoleon to finish the game at two of the program's four difficulty levels.

It's a shame that these shortcomings ruin Bill & Ted's Excellent Adventure. It has some great graphics and is appealing in a goofy sort of way, but playing this game for any length of time would force even the real Bill and Ted to utter their now world-famous comment—*Bogus!*

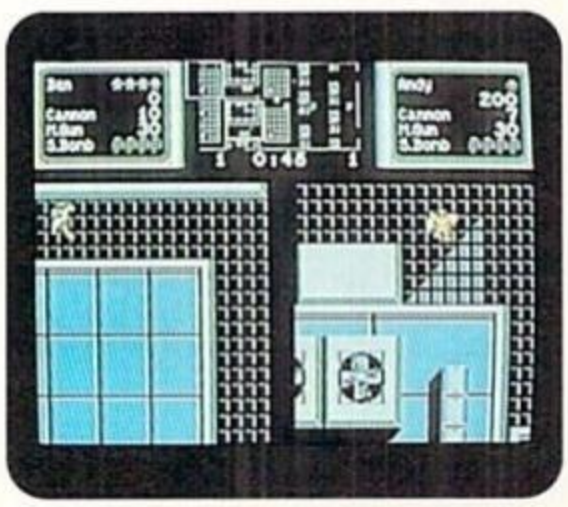
(Capstone, a Division of Intracorp, Inc., 14160 S.W. 139th Court, Miami, FL 33186. C-64/$29.95)

CRACKDOWN.....C

Battling Subterranean Cyborgs, And a Lack of Information

Crackdown. This title is short and dynamic. Unfortunately, the game's documentation doesn't state how it relates to the program's story line. This is typical of this software package, which doesn't provide enough information for its players.

The villain in the game is the evil Dr. K, the self-proclaimed ruler of what was once an underground factory. He has programmed his half-human, half-robot cyborg workers to kill people, and you must enter and destroy his domain, either by yourself or with a friend.



Crackdown features a split screen so that two can play simultaneously.

You begin with a limited supply of grenades and rounds for your machine gun and your cannon. Additional ammo can be found while exploring each of the game's levels. The locations of bombs you can detonate are displayed on computer-generated maps, which also show where hostile, trigger-happy cyborgs are lurking.

The character you control appears on half of the screen, with the other half used only during two-player games. This lets you and a friend operate independently of one another, an attractive feature.

Although the program has terrific graphics and great background music, it also has some significant problems—primarily, the manual. It completely omits some important information, such as how you earn and lose points. It also erroneously states that the CURSOR keys can be used for control, whereas only keys in the upper-left corner of the keyboard affect on-screen movement. Also, more on-screen data would have been helpful, such as the number of continues that are left.

These shortcomings limit Crackdown's fun. This is a game that, regardless of some fine features, should have been much better.

(Sega; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$34.95)

THE UNTOUCHABLES.....B–

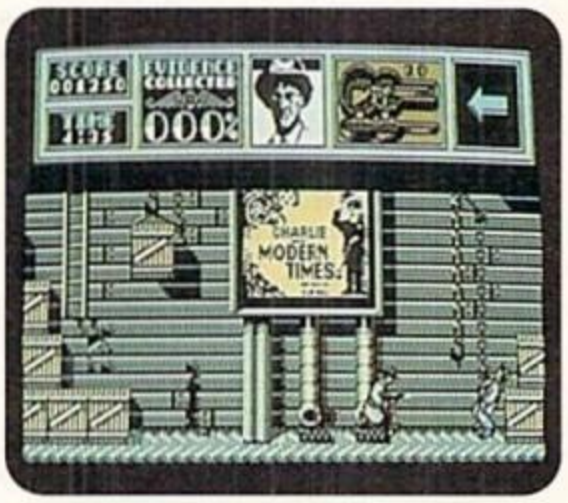
Comes on Like Gangbusters . . . But Runs Out of Bullets

Ocean Software included six scenarios in this game, which generally follows the plot of the 1990 *Untouchables* movie.

All six scenarios have time limits. During the first, you're Federal Agent Eliot Ness, who's entered a warehouse to search for illegal liquor owned by mob boss Al Capone. Instead, you find some of Big Al's bookkeepers, and if you shoot them, incriminating ledger pages fall from their hands. You can try to seize this evidence, but gun-toting gangsters attempt to blast you.

The second scenario takes place on a bridge at the U.S./Canadian border. Using a joystick or the keyboard, you control Ness and his three men as they gun down booze-smuggling crooks.

Next up is action on Chicago's streets, as you guide the head G-Man to a train station. Hoods lie in ambush, and your only weapon is a shotgun that has to be reloaded after every two shots.



Eliot Ness busts warehouse gangsters in level one of The Untouchables.

Scenario four is a reenactment of the most gripping part of the film: As Ness waits at the train station for Capone's chief accountant, he helps lift a baby carriage up a stairway. He must protect the baby and dodge the gangster's fire when the shooting starts.

Next, while the last armed criminal in the station holds a pistol to the head of Capone's accountant, you, as Agent Stone, must eliminate this threat with a single perfect shot.

Finally, you chase the odious Frank Nitty across a rooftop to avenge the death of a friend. If you win this shootout, Nitty plummets to his death.

All these game segments are embellished with crisp, finely detailed graphics and smooth animation. The program also offers a choice of either great sound effects or music.

However, the game is far from perfect. The screen flashes annoyingly as program sections load. The documentation isn't thorough enough. But most serious of all is the awkward control arrangement that makes completing the program's second level a Herculean task.

And that's a pity, especially since the game's exciting and very addictive first stage comes on like gangbusters (no pun intended). That Ocean wasn't able to keep the Untouchables at that level throughout the program can almost be considered, well, criminal.

(Ocean Software Ltd.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95) ■

Walt Latocha is a contributing editor for RUN, *as well as a Software Gallery columnist. Walt has extensive experience reviewing and writing about entertainment, education, accounting and other productivity software for the C-64 and C-128.*

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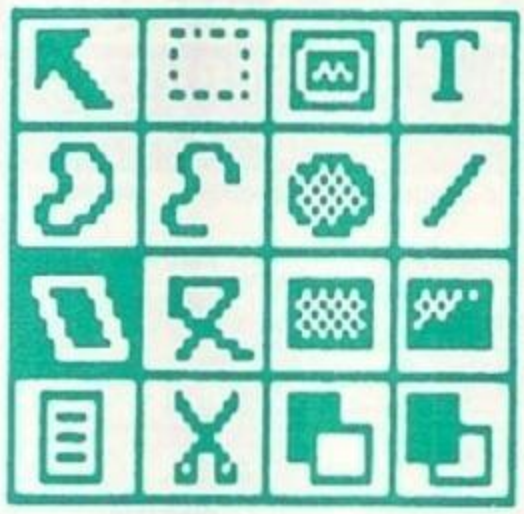

Read All About It!

geoPublish software will bring the power of the press to your Commodore desktop.

The power of the printed page has truly come to the people. The people that use computers, that is. With my C-64 and the GEOS-based desktop-publishing program, geoPublish, I've produced forms, business cards, greeting cards, postcards, lists, concert tickets, posters, calendars, maps, newsletters . . . and a music magazine with statewide circulation called *The Back Page*. I'm still awed at what geoPublish can make my eight-bit Commodore do, and so are many of my acquaintances. When someone asks whether I use an IBM, IBM clone or Macintosh to publish my magazine, I delight in revealing that it's all done on a C-64. Their expressions are priceless.

I came to publishing with no experience. I continue to learn more every day, and geoPublish lets me apply what I learn. The best thing about geoPublish is its versatility. It can turn out any type of document, and, combined with a laser printer, make that document look as good as one produced on an expensive system.

Like all GEOS applications, geoPublish uses easy procedures and is manipulated with a mouse. By clicking on the pull-down menus and Toolbox icons, you can access every function with ease and speed. It has three modes, each for a different type of operation. Here's how these modes are used:

Master Page Mode

Master Page mode lets you set up a page template for your document. What is done on this page controls and appears on every page. It can be used, for example, to set page size, number of columns and where the publication name with page number (folio) will appear on each page.

If there is something that is to appear on each page in the same place, usually it's done using a *header* and *footer*—publishing jargon for text, page numbers and perhaps graphics that appear at the top and bottom of each page. As an example, if you were designing a small newspaper, the header might consist of the publication name and logo, and the footer of the issue number, month and page number.

It can be very useful to create different masters for left and right pages. This way, page numbers and other header or footer material that appears in different (probably opposite) locations on facing pages can be arranged accordingly.

Page Layout Mode

Page Layout mode is used to place text and bit-mapped graphics onto the document pages. Layout provides a scaled-down Toolbox of ten tools that will let you lay out your pages in any way you desire. With the tools provided in Page Layout mode, you can define fields, which can be resized, where you will place text or graphics. You can import previously written text into fields and overlap the fields, so graphics fit easily onto a page with the text wrapping around.

Once you've decided where to place your text, you may need to edit it for space, flow, or other reasons. Layout mode provides an editor that works just like

By GERRY DESCOTEAUX

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geoWrite. It lets you swap, delete, add and refine text, change type fonts, sizes and styles, and do almost anything else to your file. However, be warned that this editor will change your orginal file. If you want to retain the original intact, first duplicate it via the deskTop File menu and save it to disk.

Also included in the Layout Toolbox are the similar functions Redraw and Show. The first, which redraws whatever you have on a page, is handy for cleaning up the page to see what you have so far. Show resets the type, by what's called "rippling," any time the text has been changed or the text field adjusted in Layout mode. Before rippling, the text is represented by broken diagonal lines, after by unbroken diagonal lines. The lines make the amount of space used apparent, and you can make adjustments accordingly.

Page Graphics Mode

After you've finished designing and laying out your page, enter Page Graphics mode to create personal touches. The Toolbox here is the same as the one in Master Page mode and allows you to mold graphics and text into titles, headlines, footnotes, borders, frames, or anything else you can imagine.

The selecting tool, or pointer, lets you choose fields, graphics or text to move, resize or cut from the document. It also provides access to the four Attributes boxes for editing either text, graphics that can be filled, graphics that can't be filled, or imported bit-mapped graphics.

Text changes include font; size, from 1 to 200 points; style; pattern; color; and justification—up, down, across or centered. With the Smooth function, you can smooth out the jagged surfaces of larger-size fonts.

Graphics changes include filling; switching patterns; resizing borders, boxes and circles; and altering lines, connected lines, open splines, closed splines and polygons. Imported bit-mapped images can be stretched, scaled up or down, centered and smoothed. Their patterns can be changed too.

The Master Page and Page Graphics modes both offer Preview and Zoom options. Preview displays a whole page on the screen (small text is not readable in Preview), while Zoom shows an enlarged section. In Zoom, you can scroll around the page by touching the edges with the cursor/mouse or by using a Page Window Indicator that's similar to geoWrite's. Just click on the box and place it on the area you'd like to view. Try using the keyboard shortcuts—COMMODORE/P and COMMODORE/Z—to access these options; they'll save time. In fact, I suggest you learn as many of the GEOS keyboard shortcuts as possible.

Of course, there are many details on using geoPublish, but I hope my brief description will encourage you to hop on the bandwagon. You may know nothing about it now, but you'll soon learn. You'll also find satisfaction—*and* have fun! ■

Gerry Descoteaux lives in southern New Hampshire, where he uses his C-64 and geoPublish to produce a monthly music magazine called The Back Page. ►

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geoPublish Keyboard Shortcuts

{COMD} M	Enter Master Page mode
{COMD} L	Enter Page Layout mode
{COMD} G	Enter Page Graphics mode
{COMD} X	Cut text in Edit mode
{COMD} C	Copy text in Edit mode
{COMD} T	Paste text in Edit mode
{COMD} W	Paste a picture in Edit mode
{COMD} V	Select page in Options menu
{COMD} ← (left arrow)	Move to previous page
{COMD} +	Go to next page
{COMD} L	Page break in Page menu
{COMD} P	Plain text in Style menu
{COMD} B	Bold text in Style menu
{COMD} I	Italic text in Style menu
{COMD} O	Outline text in Style menu
{COMD} U	Underline text in Style menu
{COMD} > or .	Superscript in Style menu
{COMD} < or ,	Subscript in Style menu
{COMD} A	Left justify in the Ruler
{COMD} E	Center justify in the Ruler
{COMD} R	Right justify in the Ruler
{COMD} J	Full justify in the Ruler
{COMD} K	Single-space in the Ruler
{COMD} M	One-and-a-half space in the Ruler
{COMD} D	Double-space in the Ruler
{COMD} A	Select Graphic Object Attributes
{COMD} Z	Enter Zoom mode
{COMD} P	Enter Preview mode
{COMD} S	Toggle Snap mode on/off
{COMD} R	Toggle Ratchet mode on/off
{COMD} L	Create gutters
{COMD} 1–9	Go to page number
{COMD} T	Toggle Toolbox on/off
{COMD} [or :	Create left brace {
{COMD}] or ;	Create right brace }
{COMD} ↑ (up arrow)	Create vertical line |
{COMD} - (hyphen)	Create dash —
{COMD} / (slash)	Create backslash \
{COMD} *	Create tilde ~
{COMD} @	Create grave accent `

Also, in GEOS

{COMD} O	Open disk
{COMD} C	Close disk
{COMD} I	Choose Select Input Driver dialog box

geoPublish screens: Left, choosing text to insert; Right, choosing the screen display.

Publisher's Trade Secrets

1. GeoPublish works best from a RAM expansion unit (REU) configured as a RAMdisk, because the program's 99K size makes redrawing and moving around a page tedious and slow with a floppy drive. Use an REU with at least 512K if possible. With one megabyte (1024K), you can probably work entirely in RAM.

2. A mouse is preferable, although a joystick will also work.

3. Leave a large document in Layout mode when you close it. You won't have to wait for the graphics to redraw when you reload . You will also be able to change pages faster than in Graphics mode.

4. Save your work often. For a program its size, geoPublish runs remarkably smoothly, but, like anything else, it has quirks and may lock up occasionally. That can happen, for instance, in the Zoom option of Page Graphics mode, when you open a document on a text area whose file is not on the same disk. For peace of mind, save, save, save! Of course, saving to the RAMdisk doesn't count!

5. Put the following on your work disks: the deskTop file; the geoPublish, geoWrite and geoPaint programs; the Paint Pages printer driver (so you can send your geoPublish graphics to geoPaint for pixel editing); the driver for your printer; the font files you need; and any other programs you might want to use with geoPublish. For example, I use Paint Scrap by Dennis Seitz for copying graphics larger than the edit window out of geoPaint into Photo Scraps, where they can be imported back into geoPublish or into a Photo Album. (See the geoWatch column in *RUN*'s May/June 1991 issue on page 44, for a survey of other handy GEOS program treasures.)

6. Once you've loaded GEOS, select Copy All Files, or, if your configuration allows, Copy Disk, and place the entire contents of your work disks in the RAMdisk. If your REU is large enough, copy your data files into the RAMdisk also.

7. If you have a 1581 disk drive, use it. It will make your work easier through added speed and storage space.

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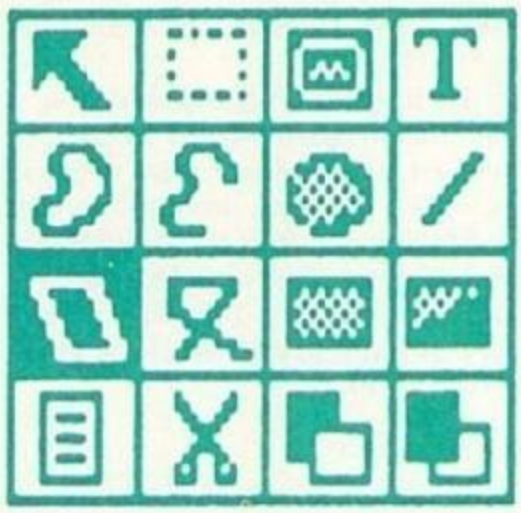

geoPublish News

With your Commodore, GEOS software and a few tools of the trade, you can soon be the proud publisher of your own newsletter.

By ROBERT W. AUSTIN

Sharing the latest news and information with colleagues, family and friends through a newsletter can be one of the most interesting and rewarding uses of desktop publishing. Newsletters can address the concerns and happenings of just about anything from international organizations or national clubs to local schools or families.

I publish a newsletter on model rocketry called *ZOG Forty-Three*. The National Association of Rocketry chose it as the best overall model rocketry newsletter in the country in 1990, and it was awarded the North American Rockwell trophy.

Do I use a big expensive system to publish my newsletter? No. To produce it, I use a C-64 and GEOS software with a Star Micronics NX-1000C printer and a single 1541 disk drive. With your Commodore and the proper software, you too can be in the newsletter business.

Of course, no matter how good a desktop publishing (DTP) program is, the quality of the finished newsletter is determined not by the program, but by you, the *editor*. You don't need a background in journalism, a bachelor of arts degree in English or a "natural instinct" for writing. (I'm a paramedic, not a professional writer.) What you do need is time, the desire to write and an interest in and knowledge of the subject you want to cover in your newsletter.

So, once you have an idea, how do you get from the concept to finished copies? What if you've never published anything before? Where do you start? Obviously, planning is one of the most important parts. Let's get an overview of how you might go about planning your newsletter.

Editorial Decisions

Write down the purpose or objective of your newsletter. Whether the focus is specific or broad, which will probably be determined by the subject, you need a clear idea. You must keep in mind who your primary readers will be: their interests, their age level, their experience in the subject matter. Chances are you will continually modify your objectives; just don't forget the importance of consistency. (You want people to recognize the newsletter from one issue to the next!) Think about your goals, write them down and review them; they aren't set in stone. When you can, ask your readers for input and ideas.

How often will the newsletter come out? How big should it be? Will it be a twice-a-year ten-page newsletter on family news or a six-page monthly on your local garden club? Monthly newsletters lend themselves to keeping up-to-date about calendar events and local club activities. Bimonthly or quarterly issues are suitable for subjects that need more lengthy or in-depth coverage. But whatever the size and frequency of your publication, don't expect to avoid last-minute deadline panics.

Next you need to choose the name of your newsletter and the design of a logo. If your organization has a formal name, you may wish to use the same name for your newsletter. It can be elaborate or simple. A logo, if used, should graphically complement or accent the name of the newsletter.

Readers will see the name and logo on each issue. It establishes your newsletter's identity. Take adequate time to think about this because once your newsletter is in production it's not advisable to change the name or logo. You will confuse your readers if you do.

The Editor's Desk

By now, I hope you're itching to start writing. But wait—you need to get some basic tools of the trade together first.

Regardless of your trusty computer, don't forget your typewriter. It is handy, for example, for making notations on diagrams or other drawings.

A dictionary is a must. Most editors, even professionals, keep a common *Webster's Collegiate Dictionary* or *American Heritage Dictionary* (Random House) close by. Both of these are available hardbound or paperback at most bookstores for a reasonable price.

I recommend you use the geoSpell proofreading program to catch spelling errors. Just remember that there are some words it won't recognize as incorrect (such as a *be* where a *by* should be). Nothing takes the place of a careful reading, and when there's any doubt, a dictionary is the only way to go.

A thesaurus is another reference book that can come in handy. It lists words with their synonyms and antonyms. With a thesaurus, you can find just the word you want and avoid over-using certain words. *Roget's Pocket Thesaurus* and *Webster's Dictionary of* ►

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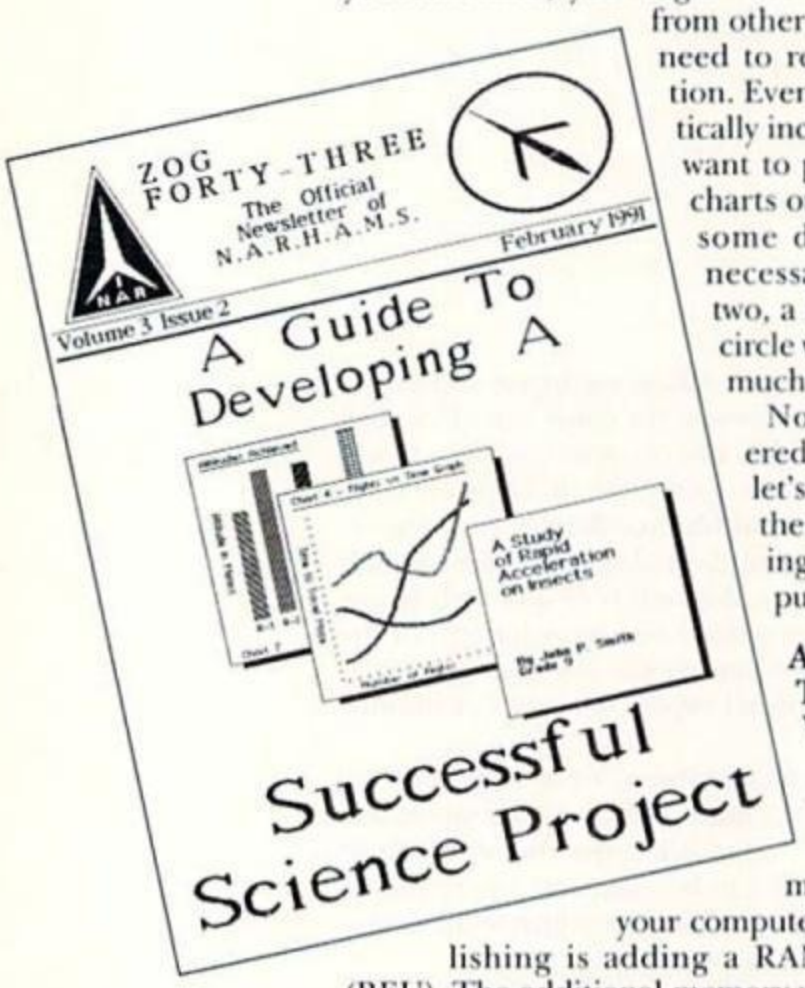
Synonyms are both inexpensive and easy to find.

Depending on the nature of your newsletter, encyclopedias, technical manuals, books and magazine articles are helpful for research. You don't need a vast personal library—your local public library is a great source of reference material.

If you plan on including illustrations in your newsletter, you may want to produce some of them yourself. Also, you might receive rough sketches from other sources that you'll need to redraw for publication. Even if you're not artistically inclined, you still may want to produce diagrams, charts or maps. To do this, some drawing tools are necessary. A triangle or two, a french curve and a circle will make your task much easier.



Now that we've covered these basic tools, let's look at the heart of the newsletter publishing system, your computer.

An REU: The Publisher's Workhorse

The initial and biggest improvement that you can make in setting up your computer for desktop publishing is adding a RAM expansion unit (REU). The additional memory will allow programs to run faster and will increase your productivity. It will also decrease wear and tear on your disk drive.

Secondly, if you have not purchased a printer, get one that is not Commodore-specific, that is, one that requires an interface such as an RS-232 (serial) or a Centronics (parallel). Commodore-specific printers use only the left two-thirds of a page for printing, which means that pages that involve graphics, boxes and so forth will be distorted. While you can work around this by using only two-thirds of the visible page, the higher quality output and ease of printing make using a non-Commodore printer desirable.

GeoPublishing, Inc.

Now let's get down to the nitty-gritty of producing a newsletter. For the sake of our discussion, I'm going to assume that you are using an REU and two disk drives. If you are using a single drive without an REU, you'll be limited to publishing four or five pages per disk. The reason for this is that data files which contain the elements that go together to make up your newsletter (text and graphics, for instance) will have to be saved by category on separate disks.

It has helped me to think of the several disks needed for using geoPublish as representing departments in an imaginary publishing company. For instance, one disk represents the Copy Room, where text is prepared, another disk the Art Department, where graphics are prepared, and so forth. I will refer to these as *system* disks. Any disk designated as a system disk is loaded into the REU.

Each system disk will have a related *data* disk, a second "room" in that department, to follow our analogy, where files created on the system disk will be saved. (For example, the Copy Room data files disk will have the files created with the Copy Room system disk.) Any disk designated as a data disk will reside in the computer's primary disk drive ("drive A"). Let's think of this setup as our own little newsletter publishing operation.

Newsroom Management

On the Copy Room disk, where writing takes place, you'll have geoWrite 2.1, Text Manager, a calculator, the deskTop, geoSpell, geoDictionary and your own dictionary. (If you're using a single drive, set up a spell-checking disk containing geoSpell, geoDictionary and your own dictionary.) This is also where you keep the fonts you want and your printer driver.

Begin the newsletter by writing the articles. Once all of the Copy Room system files are written and transferred to the Copy Room data disk, place the disk in drive A. Open up the REU RAMdisk, then the geoWrite file. Be sure to save all your files to floppy disk, not to the RAMdisk.

I recommend including article headlines at the top of article text files. This way you can see what the article is as soon as it's loaded, and your article headlines will already be spaced the same due to geoWrite's line spacing commands (1, 1½, 2). I suggest you use consistent font sizes for your headlines and subtitles (24- and 18-point, respectively, is good). You can also add headlines while in the Graphics mode, but I've found that the te first method works better and gives a more uniform appearance.

To avoid awkward "screen swapping" in the Copy Room, set the right margin at five inches; this won't affect your text when it's transferred to geoPublish. I indent paragraphs 0.2 inches from the left margin and use justified text. Try several variations and use what looks good to you.

Enter all text using the font you want in the final published copy. I like 10-point University type because it's easy to read, especially when printed by a 9-pin printer. My section headings are usually in 12-point, bold style. Again, font selection is a matter of personal taste, and what is easy on your readers.

When the text is complete, run it through geoSpell to catch misspellings. (I wait until I have five to seven text files ready to be checked. This gives me a welcome break from typing.) Now store all of the files created on the Copy Room data disk. They will stay there until the entire newsletter is complete and a final archive disk is made. This will also serve as a backup of all the text files.

Off to the Art Department

The next place we need to go is the Art Department system disk to create original graphics. (Clip art can always be imported directly into geoPublish if you don't want to make your own.) Here you have geoPaint 2.0, geoPaint 1.3, Graphics Grabber, Photo Manager, your fonts, the deskTop and the printer driver. Art Dept. procedures are just like those of the Copy Room: All work is accomplished in the REU,

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and then transferred to the data disk.

Two tips: It's a good idea to keep all your original graphics in an album or portfolio as well as saving them on the Art Dept. data disk. You may find that one of these graphics is just what you need in a future article. Also, if you'll be doing graphics that need concentric circles, keep geoPaint 1.3 on the Art Dept. system disk along with geoPaint 2.0. Circles can be completed and saved as photo scraps and then copied to geoPaint 2.0.

When the text and graphics are all ready to use, it's time to do the really fun part: Put it all together.

Publishing Central

Our next stop will be the Publishing Central system disk. Here we find geoPublish, Graphics Grabber, a Master Page file, a Page Layout file, Text Manager, Photo Manager and a Photo Album. The fonts needed, the deskTop and the printer driver are here too.

Transfer all of the files to the Publishing Central disk. Now, all the text files stored on the Copy Room data disk and any needed graphics from the Art Department disk—that is, all the files you need to create your newsletter—will be together in the REU. (If you use an REU as a 1571 RAM drive, you'll have room for a 16-page newsletter with RAM to spare.) Now it's time to run geoPublish.

Once you're working in geoPublish, you should have a blank, formatted work disk in your second floppy drive. All the data files you create will be stored here. I recommend that you use filenames that consist of the month, year and an identification number for that issue, for example, Feb 91–1. Once the file is created, go to geoPublish's Master Pages section.

I use a master page that divides my paper into two columns and five cross sections, with rule lines at the top and bottom so they appear on every page. (Note: Remember that on a Commodore printer, the printout ends at the 6 1/4-inch mark, so adjust your use of the master pages accordingly.)

Once the master pages are loaded, turn to the Page Layout section. Here you'll do most of the work on your newsletter. Using predesigned page layouts can save time. If you make your own, it's helpful to first look at other publications to see how they've done it.

When you have decided upon and set up your page layout, you can import the text files. Use the editor to check for any undesirable aspects of the imported text. For example, you'll want to check for proper indentation. Some of us can't stand to see short single words at the end of paragraphs that take up whole lines (called *widows* by people in the business). These are definitely unacceptable if they fall at the top of a new column.

Be prepared to spend some time becoming comfortable with the process of moving text around: It's one of the more challenging parts of desktop publishing. You'll do fine if you carefully follow the instructions in your geoPublish manual.

Pull quotes really grab the reader's attention and spice up a newsletter. These are usually noteworthy quotes from the article set in larger text and placed in the middle of a column. (You've probably seen them in magazines many times.)

Pull quotes will grab attention and spice up a newsletter.

I prefer to use a different style and larger font than the body of the article so that a pull quote will stand out, but you can do whatever you like best. I create pull quotes in Page Layout, using the editor, and I place them about one-third of the way down a column, with blank space and lines (rules) above and below them.

Putting in the Pictures

With the text in place in geoPublish, switch to the Page Graphics mode. Using the Text option, you can add the publication's name, a page number and an issue date. (I have found it useful to first identify my newsletter pages with letters instead of numbers, since my page arrangement won't be finalized until after the newsletter is printed in rough draft form.)

You also, of course, add your graphics using this portion of the program. The value of planning will truly be realized here. Again, this is an area that can be challenging and calls for special attention: Carefully follow the geoPublish instructions on placing graphics. However, the effort is well worth it; being able to place, arrange and integrate text and graphics is, after all, the whole reason for doing desktop publishing. The end result will certainly convince you.

Based on years of experience creating my newsletter, here are some words of advice about designing yours. First, avoid the temptation to use too many rule lines and borders; they will quickly clutter up your pages. Used sparingly they can be very effective; overused they will make a mess. Second, be sure to leave enough "white space" (nonprinted area) on your pages. Failing to do this also creates a cluttered, drab appearance.

When you're through, transfer all of your data files back to the work disk. That completes a basic page.

Page Proof & Press Run

No newsletter should *ever* go straight from the screen to the final copy. There are too many possible mistakes that you just won't see on the screen and that become very obvious on paper. So, after correctly numbering your pages as you want them to be in the final product, print a rough draft of your whole newsletter for proofing.

Now you can look for those errors that you missed on the screen (there *will* be some!), such as misplaced or misspelled words, a picture in the wrong place or any of a variety of other items editors tear their hair over. Also, at this stage you can check to make sure you have left enough room for cut-and-paste art or photos, if you're using them. Once you have everything as you want it, print your finished copy and use it as the master for the copies you will distribute.

You could photocopy your issues, but better, check prices and have a local printer print them for you so ►

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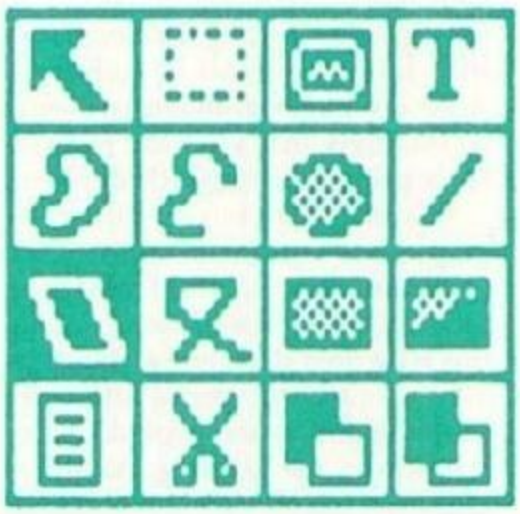
they can be folded and stapled. And don't be surprised if you're rather proud of your accomplishment—you're in the publishing business!

Final Words

Refer to other publications for various styles and ideas that you can learn from and incorporate into your own work. And don't feel that everything has to be done on the computer. Photos, cartoons and other items can be clipped and pasted in place before photocopying. (This can be very simple and effective, just be careful about using copyrighted pictures from other publications. Check up on copyright laws at a library if you plan on using this approach.) Be creative in coming up with the means of producing your finished product, and have fun doing it.

Your Commodore may not be a state-of-the-art publishing machine, but don't think that quality publishing on the C-64/128 is beyond your reach. I have the proof in hand that it can be done, easily and neatly. What will *your* newsletter's first issue be about? ■

Robert Austin is a paramedic with the District of Columbia Fire Department and a model rocket enthusiast. He's been doing desktop publishing for three years and also enjoys programming.



Inside Tips on DTP

A professional reveals the invaluable tips and techniques he uses to produce high-quality documents on his C-128

By LARRY McCOY

I bought my first C-64, 1802 monitor and 1541 disk drive because they were inexpensive and I wanted to learn more about computers. As a graphic arts professional, I could see the world changing and thought that being computer literate would help me down the line.

The Commodore machine turned out to be a bigger bonus than I thought, when Berkeley Softworks wrote GEOS. I was paying $25 to $40 per page for phototypesetting for my spare-time freelance business, but I really didn't need such high quality output. Most of the work I had was student manuals for a management consultant—manuals that were used for notetaking during slide presentations. I purchased GEOS, signed onto Q-Link to obtain laser printing from LaserDirect, and started saving money for myself and my customer.

Since that start, I've purchased a 1581 disk drive, a 1902 monitor, two RAM expansion units (a 1764 and a 1750), an SX-64 (for weekend trips), and a C-128D and monitor. On the software side, I've added geoCalc, geoFile and Newsroom. (My older son published an orchestra newsletter with Newsroom, and we had a lot of fun!)

I sold my C-64 and peripherals when the office closet started looking like a retail store. The C-128D was purchased to take advantage of the 80-column screen, which saves on eyestrain, and to obtain a keyboard with better touch.

The system I use today is the C-128D, 1581 drive, 1750 REU and a Magnavox RGB Display 80 monitor. I use geoWrite for text processing, geoPublish for layout and geoCalc to keep the books straight. The GEOS series of programs, with their easy-to-use graphic interface, work virtually as well as the software packages costing hundreds of dollars more. With the C-64/128 system still less than $1000 dollars, it's the most cost effective approach to desktop publishing for a small business.

In the last few years, I've earned $3000–$5000 per year by using my Commodore to do manuals for management and technical training and advertising for other small businesses. I've also published information booklets for the parents of the athletes on my son's cross-country team.

There are dozens of ways to take advantage of the desktop publishing capabilities of the C-128 or C-64. I'd like to share my experience with you by offering some tips on doing your own desktop publishing:

1. Take the time to learn the software you choose. In the case of GEOS, this means learning the primary keystroke combinations such as Copy and Paste (see page 24). You'll save much time and effort. Just pull down the menus and look for the equivalents to the right of the commands.

2. Keep page layouts simple, and always plan a layout before starting the computer part of the job. A layout is the arrangement of type, graphics and space on a page.

3. Find page layouts that you like in magazines,

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newsletters and other documents, and keep a clip file of them for reference.

4. Use enough space around headlines and titles to separate them from text blocks. Graphics (photos, drawings, symbols) should also have plenty of space surrounding them for emphasis.

5. Always plan the job with your client and decide how the piece will be reproduced. Will it be on a copying machine or on a printing press? Can you use dot matrix output or does your client require laser-printed masters? If possible, talk to the printer and find out what level of quality he expects. Do these things in the planning stages to save yourself problems in the future.

6. To make dot matrix printouts look less jagged, start with a large typeface and narrow margins, then reduce the output from your printer on a high-quality copier to create masters. I did this with the family Christmas letter and got rave reviews! Try starting with 12-point type or larger to ensure readability after reduction.

7. Restrict typeface variety. Many first-time desktop publishers use too many typefaces in a publication. Your first mission is to communicate effectively. Using many different typefaces will confuse the reader and make it hard to concentrate on the message. One type family, such as LW California, with variations such as plain, bold and italic, will suffice in a single document.

To emphasize the distinction between titles and text blocks, you could also use LW California bold for the titles and LW Roma plain for the text. An additional face could be used for the main title or for special symbols—for instance, LW Shattuck for bullets and the like. Remember: Tastes in type are subjective, so be sure to show your client what you intend to use.

8. Clip art is useful if you can find what you need. There are many clip-art collections advertised in *RUN* and *geoWorld*, and individual creations are available on Q-Link. Also look for people in your local user's group who have artistic talent, and don't overlook printed clip art. Your local library or art store will have magazines that contain ads for printed collections. The yellow pages are also full of clip-art images, and I've used them more than once to meet a deadline.

9. Draw your own artwork. This is difficult for many people, but here's a procedure that works well: Find a picture of what you want, and trace it onto tracing paper. Reduce or enlarge it to a convenient size on a copy machine, and copy it onto overhead transparency material. Then tape the transparency to your computer screen and trace it using your graphics program running on the screen behind the transparency. It takes patience, but it works.

10. Use LaserDirect on Q-Link for laser printing. Contact LaserSkip in E-Mail and request the *Laser Printer's Informational Kit*. LaserDirect also sells a Publisher's Kit for a nominal fee that provides information on how geoPublish documents will laser print. If you're not on Q-Link, contact LaserDirect at PO Box 20829, Milwaukee, WI 53220-0829; 414-529-5393. It's an excellent service.

11. Run proof copies of your documents on a dot matrix printer, and get approval from your client before sending the files to be laser printed on Q-Link. The client can make last minute changes and may catch spelling errors you missed.

12. Use geoPaint to do fast, rough layouts by drawing boxes with horizontal lines inside to represent text. This way you can visualize many different layouts in just a few minutes. You'll find that one idea prompts another, until you come to the one you want. Any other paint or draw package will work, too.

13. I recommend always using an REU with GEOS, and in the following way: Load the application and file on the REU, if memory permits, for maximum speed. Put all the applications and files, such as the deskTop and desk accessories, on the first page of a work disk, then use Page Select to copy them to the RAMdisk each time you start a work session. I set up many different work disks for different types of projects, and this organizes the effort easily.

14. Create your text in geoWrite rather than typing directly into the geoPublish editor. Be sure to get the text formatted, spell-checked and grammatically correct before spending a lot of time transferring it to geoPublish.

15. Suit the software to the job you're doing. A paint program with text capability does well for a one-page newsletter with more drawings than text. Newsroom, for example, is a fun way to do newsletters for the family or school, and is a good way to introduce your children (and yourself) to desktop publishing. A document with lots of text and a simple format can be handled well with geoWrite. Multiple-column documents with drawings inserted are easier to layout using geoPublish.

16. Remember that it's sometimes faster to do part of a publishing job manually. I used to find it hard at times to use geoPublish, due to the surprises I got when my laser prints came back in the mailbox. (geoPublish is *not* WYSIWYG on the laser printer, so you must measure column, gutter and graphic placement using the x–y coordinate system in the software.)

For large technical or training manuals, I now use geoWrite to create the text in "galley" fashion. All the text is typed together, page after page, with no room left for illustrations and photos. After I get the type (which I've ordered on laser paper with a wax-holdout coating), I use a hand waxing machine to coat the paper with adhesive wax and paste up the text on forms ►

Suggested Reading on Commodore Desktop Publishing

Desktop Publishing with the C-64
By Susan Lamb
***RUN* Magazine**
March 1988
(Other good sources are listed in this article.)

geoPublish User Manual (Chapter 2)
By Patricia Huey and Matthew G. Loveless
Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704

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I've preprinted. I can cut the type apart and place it with illustrations inserted in the right places. This is faster for me than measuring all the artwork and leaving accurate space in geoPublish. Use a drawing table, straightedge and triangle to keep type square to the page.

17. What's the best way to include photographs in your documents? There are several methods, and the next few tips will cover some of them. But a little explanation is necessary first.

Photographs have to be converted from what you see when you look at a print to what a printing press or copy machine can mechanically reproduce. In graphic arts language, a print is a *continuous tone* image, containing all shades of gray from white to black. Since printing presses reproduce images mechanically by transferring ink from a plate to paper, the impression of various grays must be created with tiny black dots at various densities.

Look at a photo in your newspaper with a magnifying glass to see what I mean. These pictures are called *halftones*, referring to the process of shooting a picture of a photo through a glass or plastic screen onto high-contrast film or paper. Today, halftones are also created electronically via computers. Making halftones is the problem you must tackle to put photographs in your publications.

18. Photos can be scanned as halftones, stored in a computer and integrated with desktop publishing software, then output on high-resolution (many dots per inch) laser printers or typesetters. This is not impossible in the C-64/128 context, but it's generally beyond the scope of in-home desktop publishing for memory and output-device reasons. Incorporating photo-graphs manually is easier to control.

19. Photo method 1: Using black-and-white prints if possible, go to a printer or lithographic photographer and ask for positive halftone prints that are enlarged or reduced to the size you need for final publication. Color photographs can be reproduced in black-and-white, but the quality suffers. (Printing color photos in color is beyond the budget of most home desktop publishers.)

Tell the photographer how the halftones will be reproduced (copier or press). He will determine the correct halftone line screen and contrast from this information. I generally use a 100-line screen for copier reproduction and 133-line screen for printing. I employ this method for work to be reproduced on a copying machine, so the client can see the final result easily and I can check the results before delivery.

20. Photo method 2: Draw ruled or filled boxes (manually or on the computer in geoPublish) to the size of the final photographs, and place them in your text in the proper locations. Supply the printer with your photo prints. On the back, mark the final size (expressed as a percentage of original size), and put crop marks on the edges of the photos, or on pieces of tracing paper over the photos. Crop marks indicate where the photo should be trimmed if you don't want the whole image to show.

The printer will shoot the halftones of the prints onto negative film, then combine the halftone negatives and line negatives. The ruled or filled box is clear on the negative and lets the printer see where to put the halftone. This method is best for commercially printed jobs, where the printer wants to retain control over the process internally. Since the printer has data on what works best with his equipment, the job will turn out better in most cases.

21. Send a *dummy* to the printer along with the photographs and final copy. A dummy is a graphic arts term for a mock-up of the final printed piece and does not refer to a person of limited intelligence; the printing dummy does, in fact, hold all of the intelligence in the job as far as the printer is concerned. It shows how the pages are collated, where photographs go, where color inks go (if you're using more than one), and anything else you want the printer to know. It also helps your client understand the job, in case he has to communicate with the printer. Your dummy is the link to a correctly printed job. Make the dummy by copying your masters and writing needed information on the copies.

22. Think about what paper stock to use for your publication. A low-cost piece can look rich if printed on a nice stock. Print covers on heavier stock than the text to give the final piece more weight and a finished, professional touch. Most copy and print shops have a wide range of paper available and can advise you on your selection.

23. How will you put together, or bind, your booklet, newsletter or manual? A number of low-cost alternatives are available. The least expensive is corner stitching—stapling the upper-left corner of the piece. This works well for one to eight pages. Saddle stitching is used for booklets that have folded two-page spreads with multiple spreads, stapled together at the fold.

Another low-cost method for booklets is thermal binding, where a heating machine glues the pages and covers together on the binding side. For documents that go into three-ring binders, three-hole punching is naturally the finishing touch. Simply folding a single sheet one or more times creates a brochure. Visit a copy shop or small printer before starting the project to find out what your options are.

24. You've finished your first job for the school PTA or the small business down the street. Take a few minutes to write down all the typing and printing specifications you encountered in the process, and file them with a copy of the finished product. When the client comes back and requests a publication "just like the other one that I liked," you'll know what to do without experimenting.

25. Make a copy of your laser printing before pasting up, in case you find a typographical error. Then you can paste up the correct word in place of the typo, to save turnaround time, transportation charges and client strife!

The Last Tip: Have fun doing your desktop publishing projects! Keep your eyes and ears open, and scan the magazine and book stands for more information. Look at what the MS-DOS and Macintosh worlds are doing, and adapt the ideas to your Commodore. You can accomplish a great deal with your C-64 or C-128, and derive great satisfaction from spending much less than your colleagues with high-cost desktop publishing systems. ■

Larry McCoy works as a technical artist for Motorola, Inc., and runs his own part-time business.

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Some Like It Hot

Though it's steamy outside, you can plan now for winter's chill with Fuel Compare.

By HAROLD BENTLEY

Ahhhh . . . summertime! It's hot, the sun is shining, and mosquitoes are feasting happily on barbecued sunbathers. So why discuss the relative merits of your home heating fuel now?

Because summer is the time to replace that old furnace, purchase add-on heating equipment and take advantage of off-season fuel discounts. Of course, as we all know, prices change so quickly these days the fuels that were bargains when you bought your house could now be very costly.

Fuel Compare will help you understand how heating fuel costs measure up to one another at current prices. The program reviews the cost efficiency of the electric heat pump, standard electric heat, natural gas, #2 oil, propane (LP gas), kerosene (K1), coal, hardwood and softwood.

Using information about each fuel's heating efficiency, Fuel Compare calculates a standard *Energy Cost Index* (that is, dollars per unit of heat), which provides an accurate basis for comparison. Of course, you'll have to do a little research to gather current fuel prices in your area, but that merely involves a few telephone calls or a look in your local newspaper.

Program Features

Fuel Compare is written entirely in Basic. Type it in from Listing 1, using *RUN*'s Checksum on page 60.

The program operates from a menu. Options 1–9 present data on each of the nine types of fuel, including energy content, cost per unit and heating system efficiency. Although you can change any of the information, the only changes you will usually make are to the cost per unit of each fuel.

(Note: The figures given for heating system efficiency are standard, and will be correct for most systems. Keep in mind, however, that some systems will lose efficiency as they get older.)

The changes that you make while running the program will not be saved. To change any of the values permanently, you must modify the program.

Once you've entered the various fuel costs, select A from the menu. The computer will calculate and display a table of fuel costs and the Energy Cost Indexes (ECIs). From there you can get a bar-graph display and printouts of all the information. Figure 1 shows a sample bar graph that was created using Fuel Compare.

Getting Technical: What Does It All Mean?

All you really need to know to understand the graph is that the smaller the bar, the more cost effective the fuel it represents. However, if you're planning on using the information to make a purchase (which is, after all, the main reason for doing this), you ought to understand the process more thoroughly.

To calculate the ECI, three variables are necessary: the fuel's cost per unit, which you provide; the fuel's heat content per unit; and the efficiency of the heating equipment that will be handling the fuel. The ECI calculation is shown in Figure 2.

The amount of heat given off by a fuel is measured in BTUs (*British Thermal Units*). One BTU of heat will raise one pound of water one degree fahrenheit. Heating fuels are commonly discussed in millions of BTUs. For example, hardwood produces 21 million BTUs per cord (128 cubic feet), whereas a cord of softwood produces 17 million.

Most heating systems can only release a percentage of the potential BTUs of the fuel they use, and are rated accordingly. Gas furnaces, for example, can be up to 97 percent efficient, which means they release 97 percent of the heating power contained in the gas they burn. Wood-burning fireplaces can be as low as ten percent efficient, whereas some woodstoves have a rating of 65 percent. Standard (resistant) electric heat is 100 percent efficient, but, due to the cost of electricity, that doesn't necessarily mean that it's the most economical fuel you can use.

Let's look at an example: Propane produces approximately 94,000 BTUs ►

RUN it right: **C-64 or C-128 (in 40-Column mode; printer optional)**

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per gallon, and a good propane furnace can heat with 80 percent efficiency. If propane costs 98 cents per gallon, its ECI is 13, meaning that a million BTUs would cost $13. Natural gas, on the other hand, might cost 53 cents per 100 cubic feet. With the same 80-percent-efficient furnace, its ECI would be 7 ($7 per million BTUs), a savings of almost half.

Not So Fast

After running Fuel Compare, you might be tempted to pull out your old heating system and replace it with a new, super-efficient one. But hold on—there are several other things to consider.

Fuel Compare doesn't take into account purchase and installation costs, maintenance bills, fuel delivery charges and convenience, and these are certainly things you want to consider. If a new system saves you one dollar on every million BTUs, it may take you years to recover the costs of the new system. So don't let the results you get from this program make you do something rash!

Still, it's worthwhile comparing the various fuels and heating systems, especially if you're building or need to purchase a new heating system. Fuel Compare can easily demonstrate not only the most economical fuel, but the most stable one in these unstable times. R

Harold Bentley is a computer hobbiest who started programming about eight years ago on a Commodore VIC-20.

Figure 2. How to calculate the Energy Cost Index in dollars per million BTU.

$$\text{Energy Cost Index} = \frac{\text{(cost per unit)} \times \text{(1,000,000)}}{\text{(energy content)} \times \text{(\% efficiency)}}$$

Listing 1. Fuel Compare program. (Available on the July/August ReRUN disk. To order call 800-343-0728.)

```
10 REM FUEL COMPARE      :REM*229
20 R$=CHR$(16)           :REM*154
30 F$(1,0)="HARDWOOD":F$(1,1)="
   CORD":F$(1,2)="100":F$(1,3)=
   "50":F$(1,4)="21      :REM*66
40 F$(1,5)=" MILLION"    :REM*153
50 F$(2,0)="SOFTWOOD":F$(2,1)="
   CORD":F$(2,2)="100    :REM*42
60 F$(2,3)="50":F$(2,4)="17":F$
   (2,5)=" MILLION"      :REM*116
70 F$(3,0)="ANTHRACITE COAL
                         :REM*221
80 F$(3,1)="TON":F$(3,2)=" 85":
   F$(3,3)="65":F$(3,4)="25":F$
   (3,5)=" MILLION       :REM*55
90 F$(4,0)="NATURAL GAS":F$(4,1
   )="100 CU.FT":F$(4,2)=".53":
   F$(4,3)="80           :REM*168
100 F$(4,4)="102000"     :REM*157
110 F$(5,0)="PROPANE":F$(5,1)="
   GALLON":F$(5,2)=".980":F$(5
   ,3)="80"              :REM*129
120 F$(5,4)="94000       :REM*21
130 F$(6,0)="KEROSENE (K1 GRADE
   )":F$(6,1)="GALLON    :REM*90
140 F$(6,2)="1.33":F$(6,3)="80"
   :F$(6,4)="135000"     :REM*154
150 F$(7,0)="FUEL OIL (#2 GRADE
   )                     :REM*239
160 F$(7,1)="GALLON":F$(7,2)="1
   .23":F$(7,3)="65":F$(7,4)="
   139400                :REM*67
170 F$(8,0)="ELECTRIC HEAT PUMP
   ":F$(8,1)="KWH":F$(8,2)=".0
   92":F$(8,3)="150      :REM*20
180 F$(8,4)="3413"       :REM*159
190 F$(9,0)="ELECTRIC RESIS HEA
   T":F$(9,1)="KWH":F$(9,2)=".
   072                   :REM*199
200 F$(9,3)="100":F$(9,4)="3413
   "                     :REM*230
210 POKE53280,6:POKE53281,6:T$=
   "{SHFT CLR}{7 SPACEs}FUEL C
   OST COMPARISON:{CRSR DN}"
                         :REM*234
220 PRINTT$:PRINT:PRINT:PRINT:F
   ORC=1TO9:PRINT"{4 SPACEs}";
   C;".{2 SPACEs}";F$(C,0):NEX
   T                     :REM*126
230 PRINT"{2 CRSR DNs}{3 SPACEs
   }(1-9){2 SPACEs}SEE FUEL SP
   ECIFICATIONS":PRINT"{5 SPAC
   Es}{CTRL 9}A{CTRL 0}{4 SPAC
   Es}CALCS AND GRAPH :REM*224
240 PRINTTAB(8)"{3 CRSR DNs}MAK
   E A SELECTION!"       :REM*240
250 GOSUB400:IFA$="A"THEN450
                         :REM*214
260 A=VAL(A$)            :REM*220
270 IFA>9THENA=9         :REM*145
280 IFA<1THENA=1          :REM*33
290 PRINTT$:PRINT"{3 CRSR DNs}{
   3 SPACEs}FUEL#"A;" ";F$(A,0
   )                     :REM*189
300 PRINT"{2 CRSR DNs}{2 SPACEs
   }ENERGY CONTENT=";F$(A,4);F
   $(A,5)" BTU/";F$(A,1)
                         :REM*137
310 PRINT"{2 SPACEs}HEATING SYS
   TEM EFFICIENCY=";F$(A,3);"%
                         :REM*4
320 PRINT"{2 SPACEs}COST PER ";
   F$(A,1);"= $";F$(A,2)
                         :REM*55
330 PRINT"{6 SPACEs}(UNIT=$/";F
   $(A,1);")"            :REM*120
340 PRINT"{2 CRSR DNs}{3 SPACEs
   }{CTRL 9}C{CTRL 0}ORRECT{3
   SPACEs}{CTRL 9}N{CTRL 0}EXT
   {3 SPACEs}{CTRL 9}L{CTRL 0}
   AST{3 SPACEs}{CTRL 9}M{CTRL
    0}ENU                :REM*193
350 GOSUB400:IFA$="N"THENA=A+1:
   GOTO270               :REM*131
360 IFA$="L"THENA=A-1:GOTO270
                         :REM*30
370 IFA$="C"THENGOSUB420:GOTO27
   0                     :REM*91
380 IFA$="M"THENGOTO220:REM*159
390 GOTO350              :REM*215
400 GETA$:IFA$=""THEN400:REM*35
410 RETURN               :REM*42
420 PRINT"{CRSR DN}{5 SPACEs}SY
   STEM EFFICIENCY (%): ";F$(A
   ,3):PRINT"{CRSR UP}"TAB(26)
   ;:INPUTF$(A,3)        :REM*144
430 PRINT"{CRSR DN}{5 SPACEs}CO
   ST PER ";F$(A,1);"{2 SPACEs
   }$ ";F$(A,2)          :REM*243
440 PRINT"{CRSR UP}"TAB(LEN(F$(
   A,1))+16);:INPUTF$(A,2):RET
   URN                   :REM*154
450 GOSUB460:FL=1:GOTO510
                         :REM*227
460 PRINTT$:PRINT"{3 CRSR DNs}{
   2 SPACEs}ONE MOMENT !":FORC
   =1TO3                 :REM*252
470 F$(C,6)=STR$((VAL(F$(C,2))/
   ((VAL(F$(C,4)))*(VAL(F$(C,3
   ))/100))))            :REM*144
480 GOSUB840:NEXT:FORC=4TO9
                         :REM*1
490 F$(C,6)=STR$((VAL(F$(C,2))/
   ((VAL(F$(C,4))/1000000)*(VA
   L(F$(C,3))/100))))    :REM*90
500 GOSUB840:NEXT:RETURN
                         :REM*143
510 PRINT"{SHFT CLR}{CRSR DN}"T
   AB(12)"ENERGY COST INDEX:"
                         :REM*84
520 PRINTTAB(10)"(COST PER MILL
   ION BTU)":PRINTTAB(33)"{CRS
   R DN}ENERGY           :REM*51
530 PRINT"{6 SPACEs}FUEL:"TAB(2
   3)"COST:"TAB(35)"COST":PRIN
   TTAB(34)"INDEX        :REM*101
540 PRINT"-----------------{3
   SPACEs}----------{3 SPACEs}
   -----":FORA=1TO9      :REM*191
550 PRINTF$(A,0)TAB(21)"$";F$(A
   ,2);"/";F$(A,1)TAB(38-LEN(F
   $(A,6)))F$(A,6):NEXT
                         :REM*142
560 PRINT"{2 CRSR DNs}{2 SPACEs
   }{CTRL 9} BAR GRAPH {CTRL 0
   } (Y/N)":GOSUB400:IFA$="Y"T
   HEN930                :REM*13
570 PRINT"{CRSR DN}{2 SPACEs}{C
   TRL 9} HARDCOPY{2 SPACEs}{C
   TRL 0} (Y/N)":GOSUB400:IFA$
   ="N"THEN220           :REM*209
580 OPEN4,4:PRINT#4,TAB(30)"FUE
   L COST COMPARISON"    :REM*20
590 PRINT#4,TAB(29)"-----------
   ----------            :REM*81
600 PRINT#4,TAB(25)"ENERGY COST
    INDEX ($/MILLION BTU)":PRI
   NT#4:FORA=1TO8STEP2   :REM*17
```

Figure 1. Sample Fuel Compare bar graph.

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HOME HEATING

```
61Ø PRINT#4,R$"ØØ"A". FUEL="F$(
    A,Ø)CHR$(16)"4Ø"A+1". FUEL=
    "F$(A+1,Ø)            :REM*134
62Ø PRINT#4,R$"Ø5ENERGY CONTENT
    ="F$(A,4)F$(A,5)" BTU/"F$(A
    ,1);                  :REM*95
63Ø PRINT#4,R$"45ENERGY CONTENT
    ="F$(A+1,4)F$(A+1,5)" BTU/"
    F$(A+1,1)             :REM*25
64Ø PRINT#4,R$"Ø5HEATING SYSTEM
     EFFICIENCY="F$(A,3)"%";
                          :REM*95
65Ø PRINT#4,R$"45HEATING SYSTEM
     EFFICIENCY="F$(A+1,3)"%
                          :REM*48
66Ø PRINT#4,R$"Ø5COST PER "F$(A
    ,1)"=$"F$(A,2);       :REM*243
67Ø PRINT#4,R$"45COST PER "F$(A
    +1,1)"=$"F$(A+1,2) :REM*176
68Ø PRINT#4,R$"Ø5ENERGY COST IN
    DEX: $";F$(A,6);      :REM*219
69Ø PRINT#4,R$"45ENERGY COST IN
    DEX: $";F$(A+1,6)  :REM*2Ø6
7ØØ PRINT#4:NEXT:PRINT#4,R$"ØØ"
    9". FUEL="F$(9,Ø)     :REM*82
71Ø PRINT#4,R$"Ø5ENERGY CONTENT
    ="F$(9,4)F$(9,5)" BTU/"F$(9
    ,1)                   :REM*43
72Ø PRINT#4,R$"Ø5HEATING SYSTEM
     EFFICIENCY="F$(9,3)"%
                          :REM*192
73Ø PRINT#4,R$"Ø5COST PER "F$(9
    ,1)"=$"F$(9,2);       :REM*134
74Ø PRINT#4,R$"42ENERGY{2 SPACE
    s}(COST PER UNIT)*(1ØØØØØØ)
                          :REM*147
75Ø PRINT#4,R$"Ø5ENERGY COST IN
    DEX: $";F$(9,6);      :REM*Ø
76Ø PRINT#4,R$"43COST = {25 SHF
    T *s}                 :REM*59
77Ø PRINT#4,R$"42INDEX:{3 SPACE
    s}(ENERGY CONTENT)*(%EFF)"
                          :REM*36
78Ø PRINT#4:PRINT#4:FORC=1TO9
                          :REM*221
79Ø PRINT#4,R$"ØØ";C;LEFT$(F$(C
    ,Ø),19);              :REM*1
8ØØ H=52:GOSUB97Ø:PRINT#4,R$"23
    ";                    :REM*231
81Ø FORQ=1TOZ:PRINT#4,"{CTRL 9}
     {CTRL Ø}";:NEXT:PRINT#4,"{
    LEFT ARROW}$";F$(C,6):NEXT
                          :REM*93
82Ø PRINT#4,R$"2ØENERGY COST IN
    DEX: (COST PER MILLION BTU)
    "                     :REM*153
83Ø PRINT#4:CLOSE4:GOTO22Ø
                          :REM*175
84Ø A=VAL(F$(C,6)):D=A+5.5*1Ø{U
    P ARROW}-1:B=INT(D*1Ø{UP AR
    ROW}Ø)/1Ø{UP ARROW}Ø:REM*83
85Ø F$(C,6)=MID$(STR$(B),2,3):R
    ETURN                 :REM*118
86Ø PRINT#4,R$"ØØ"A". FUEL="F$(
    A,Ø)CHR$(16)"4Ø"A+1". FUEL=
    "F$(A+1,Ø)            :REM*141
87Ø PRINT#4,R$"Ø5ENERGY CONTENT
    ="F$(A,4)F$(A,5)" BTU/"F$(A
    ,1);                  :REM*82
88Ø PRINT#4,R$"45ENERGY CONTENT
    ="F$(A+1,4)F$(A+1,5)" BTU/"
    F$(A+1,1)             :REM*18
89Ø PRINT#4,R$"Ø5HEATING SYSTEM
     EFFICIENCY="F$(A,3)"%";
                          :REM*1ØØ
9ØØ PRINT#4,R$"45HEATING SYSTEM
     EFFICIENCY="F$(A+1,3)"%
                          :REM*55
91Ø PRINT#4,R$"Ø5COST PER "F$(A
    ,1)"=$"F$(A,2);       :REM*248
92Ø PRINT#4,R$"45COST PER "F$(A
    +1,1)"=$"F$(A+1,2) :REM*2Ø1
93Ø PRINT"{SHFT CLR}{CRSR DN}"T
    AB(12)"ENERGY COST INDEX:"
                          :REM*191
94Ø PRINTTAB(1Ø)"(COST PER MILL
    ION BTU){2 CRSR DNs}":H=18:
    FORC=1TO9:GOSUB97Ø :REM*1Ø9
95Ø PRINTF$(C,Ø)TAB(19);:FORQ=1
    TOZ:PRINT"{CTRL 9} {CTRL Ø}
    ";:NEXT               :REM*26
96Ø PRINT"{LEFT ARROW}";F$(C,6)
    :NEXT:GOTO57Ø         :REM*165
97Ø HV=VAL(F$(1,6)):FORA=ØTO9:I
    FVAL(F$(A,6))>HVTHENHV=VAL(
    F$(A,6))              :REM*226
98Ø NEXT:Z=H*(VAL(F$(C,6)))/HV:
    RETURN                :REM*3Ø
```

■

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Yoot

This 128 version of a classic Korean board game will provide hours of challenging fun for the whole family.

By KIRK WARD

For centuries Koreans have enjoyed Yoot, a game of strategy and chance. The game challenges two players, Black and White, to race four game pieces around paths on the board to the Home square.

The pieces begin in a Start box, and Black always moves first. Instead of rolling dice, each turn you "toss" four tiles that are black on one side and white on the other. The number of black sides showing after the toss is usually the number of spaces you move, but, if all the tiles come up white, you move five spaces. The Korean names for moves of one through five spaces are Doe, Gae, Gul, Yoot and Moe, respectively.

Following the toss, one of your four pieces will turn red; that's the one chosen by the program to move. By pressing the space bar, you can select a different piece to move. When you've made your selection, press RETURN.

The playing board is laid out with shortcuts at each corner and in the middle. The shortcuts are indicated by large circles and directional arrows. To use a shortcut, you must end your turn on a large circle. Then, the next time you move that piece, it will head in the direction the arrow indicates. If you don't end up on the large circle, you'll pass by the shortcut.

If one of your pieces lands on another, they combine and move as one from then on. If your piece lands on an opposing piece, the latter returns to Start.

Extra turns are awarded for moves of four or five spaces, and for vanquishing an opposing piece. At the start of the game, you can select whether players can earn one or multiple extra turns in a single move.

When you get to the last space before the Home square, remember that you don't need an exact roll to enter Home.

So, warm up your fingers and type in the program from Listing 1, using the Checksum (p. 60) to catch typing errors. Then, with good strategy and a little luck, you can win at Yoot. R

Kirk Ward is an electronics technician who works on a helicopter simulator in Korea.

Listing 1. Yoot program. (Available on the July/August ReRUN disk. To order, call 800-343-0728.)

```
5 REM YOOT - KIRK WARD :REM*239
10 TRAP1560 :REM*169
20 PRINT"{SHFT CLR}":COLOR4,7:C
   OLOR0,16:PRINT"{CTRL 7}{6 CR
   SR DNs}" :REM*160
30 PRINTSPC(13)"{CTRL 2}{4 SHFT
    Qs} {CTRL 3}YOOT {CTRL 1}{4
    SHFT Qs}{CTRL 7}":PRINT
   :REM*208
40 PRINT"{3 SPACEs}(TECHNICAL A
   DVISOR: KANG TOK SIL)"
   :REM*93
50 PRINT:PRINT:PRINTSPC(6)"{CTR
   L 1}MULTIPLE EXTRA TURNS? (Y
   /N)":PRINT"{CTRL 7}":REM*236
60 GETA$:IFA$=""THEN60 :REM*59
70 IFA$="Y"THENXT=1:GOTO90
   :REM*168
80 IFA$<>"N"THEN60 :REM*5
90 PRINT:PRINT:PRINT" {CTRL 9}O
   NE MOMENT PLEASE -- SETTING
   UP SCREEN":SLEEP2:PRINT"{SHF
   T CLR}" :REM*234
100 FAST:PL$(1)="BLACK":PL$(2)=
    "WHITE":X=RND(-TI):DIMBX(30
    ),BY(30),MP(30) :REM*8
110 S(1)=4:S(2)=4:FORX=1TO5:REA
    DM$(X):NEXT :REM*125
120 FORX=0TO5:BX(X)=184:READBY(
    X):NEXT:FORX=6TO9:BY(X)=8:R
    EADBX(X):NEXT :REM*169
130 RESTORE1540:FORX=15TO10STEP
    -1:BX(X)=8:READBY(X):NEXT
    :REM*118
140 FORX=19TO16STEP-1:BY(X)=184
    :READBX(X):NEXT :REM*177
150 FORX=20TO24:READY:BY(X)=Y:B
    Y(X+5)=Y:NEXT:BX(30)=184:BY
    (30)=184 :REM*172
160 BX(0)=BX(30)+24:BY(0)=BY(30
    )+50 :REM*123
170 Z=9:FORX=20TO24:READY:BX(X)
    =Y:BX(X+Z)=Y:Z=Z-2:NEXT
    :REM*194
180 GRAPHIC1,1:COLOR0,13:COLOR1
    ,7:COLOR4,1:COLOR5,1
    :REM*247
190 CIRCLE1,12,12,12,9:CIRCLE1,
    52,12,8,6:CIRCLE1,84,12,4,3
    :REM*154
200 PAINT1,12,12:PAINT1,52,12:P
    AINT1,84,12 :REM*75
210 CIRCLE1,100,100,6,4:PAINT1,
    100,100:SSHAPEC5$,94,96,117
    ,116 :REM*26
220 SSHAPEC1$,0,0,24,24:SSHAPEC
    2$,44,4,60,20:SSHAPEC3$,80,
    8,87,15 :REM*144
230 SSHAPEC4$,80,8,103,28:SSHAP
    EB1$,204,8,227,31:BOX1,240,
    8,247,15,,1 :REM*48
240 SSHAPEB2$,240,8,247,15:SPRS
    AVC4$,1:FORX=2TO6:SPRSAVC5$
    ,X:NEXT:SCNCLR :REM*86
250 BOX1,12,12,188,188:DRAW1,12
    ,12TO188,188:DRAW1,12,188TO
    188,12 :REM*66
260 GSHAPEC1$,0,0,2:GSHAPEC1$,0
    ,176,2:GSHAPEC1$,176,0,2:GS
    HAPEC1$,176,176,2 :REM*133
270 GSHAPEC1$,88,88,2 :REM*3
280 Y=4:Z=180:FORX=44TO140STEP3
    2:GSHAPEC2$,X,Y,2:GSHAPEC2$
    ,Y,X,2 :REM*171
290 GSHAPEC2$,X,Z,2:GSHAPEC2$,Z
    ,X,2:NEXT :REM*94
300 Y=12:Z=172:FORX=1TO2:Y=Y+24
    :Z=Z-24 :REM*112
310 GSHAPEC2$,Y,Y,2:GSHAPEC2$,Y
    ,Z,2:GSHAPEC2$,Z,Z,2:GSHAPE
    C2$,Z,Y,2:NEXT :REM*8
320 COLOR1,1:DRAW1,200,175TO200
    ,160:DRAW1,196,164TO200,160
    TO204,164 :REM*124
330 DRAW1,36,20TO47,31:DRAW1,48
    ,24TO48,31TO40,31 :REM*103
340 DRAW1,163,20TO152,31:DRAW1,
    151,25TO151,31TO159,31
    :REM*74
350 DRAW1,31,179TO47,179:DRAW1,
```

RUN it right: **C-128 (in 40-Column mode)**

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```
    43,175TO47,179TO43,183
                          :REM*113
36Ø DRAW1,124,1Ø8TO135,119:DRAW
    1,136,112TO136,119TO128,119
    :SLOW                 :REM*78
37Ø CHAR1,26,23,"START" :REM*96
38Ø COLOR1,7:CHAR1,33,13,"START
    ":CHAR1,33,19,"HOME"
                          :REM*188
39Ø BOX1,252,112,316,148:BOX1,2
    52,16Ø,316,196        :REM*167
4ØØ Z=256:FORX=1TO4:COLOR1,1:GS
    HAPEC3$,Z,12Ø:COLOR1,2:GSHA
    PEC3$,Z,136:Z=Z+16 :REM*167
41Ø NEXT                  :REM*3Ø
42Ø IFPL=1THENPL=2:ELSEPL=1
                          :REM*1Ø6
43Ø P$=PL$(PL)+" TURN":COLOR1,P
    L:CHAR1,27,1,P$:B=1 :REM*49
44Ø CHAR1,27,2,"HIT RETURN",B
                          :REM*254
45Ø GETP$:IFP$<>CHR$(13)THENB=A
    BS(B-1):GOSUB143Ø:GOTO44Ø
                          :REM*45
46Ø MV=Ø:FORX=1TO4:M(X)=INT(RND
    (1)*2):NEXT           :REM*255
47Ø U=216:FORX=1TO4:MV=MV+M(X):
    CL=M(X):IFCL=ØTHENCL=2
                          :REM*217
48Ø COLOR1,CL:GSHAPEC2$,U,32:U=
    U+24:NEXT             :REM*8Ø
49Ø B=1:IFMV=ØTHENMV=5 :REM*219
5ØØ IFMV=4ORMV=5THENGOSUB15ØØ
                          :REM*16
51Ø COLOR1,PL             :REM*129
52Ø A$=M$(MV)+": MOVE"+STR$(MV)
    :CHAR1,27,7,A$:B=Ø:S=Ø
                          :REM*158
53Ø GOSUB144Ø:GOSUB142Ø:IFPL=2T
    HENS=4                :REM*67
54Ø S=S+1:IFS>4*PLTHENS=1+((PL-
    1)*4):GOSUB144Ø       :REM*54
55Ø FORX=1TO8:IFSP(S)=DP(X)THEN
    U=1                   :REM*214
56Ø NEXT:IFU=1THENU=Ø:GOTO54Ø
                          :REM*114
57Ø IFHM(S)=1THEN54Ø      :REM*94
58Ø Z=SP(S):DP(S)=Z:IFZ=ØTHENX=
    28Ø+(16*(S(PL)-1)):Y=17Ø+(1
    6*(PL-1)):GOTO6ØØ     :REM*69
59Ø X=BX(Z)+24:Y=BY(Z)+5Ø
                          :REM*169
6ØØ IFMP(Z)>1THENC=BS(S):SPRITE
    C,1,3:WS=2:GOTO62Ø    :REM*38
61Ø MOVSPR1,X,Y:SPRITE1,1,3:WS=
    1                     :REM*119
62Ø GETA$:IFA$<>CHR$(13)ANDA$<>
    CHR$(32)THENB=ABS(B-1):GOSU
    B142Ø:GOTO62Ø         :REM*112
63Ø IFWS=2THENSPRITEC,1,PL:GOTO
    65Ø                   :REM*24Ø
64Ø SPRITE1,Ø             :REM*186
65Ø IFA$=CHR$(32)THEN54Ø
                          :REM*172
66Ø IFZ=ØTHENS(PL)=S(PL)-1:COLO
    R1,13:GOTO7ØØ         :REM*96
67Ø IFWS=2THENMOVSPR2,X-2,Y:SPR
    ITE2,1,3:SPRITEC,Ø:GOTO71Ø
                          :REM*122
68Ø IFZ=ØTHENS(PL)=S(PL)-1:COLO
    R1,13:GOTO7ØØ         :REM*124
69Ø COLOR1,7              :REM*94
7ØØ GSHAPEB2$,X-24,Y-5Ø:SPRITE1
    ,1,3                  :REM*34
71Ø MC=MV:IFMP(Z)>1THENXP=Z
                          :REM*143
72Ø MP(Z)=Ø:Z2=Ø          :REM*166
73Ø IFZ=19THENZ=29        :REM*235
74Ø IFZ=5THENZ=19         :REM*199
75Ø IFZ=1ØTHENZ=24:Z1=1 :REM*82
76Ø MC=MC-1:Z=Z+1:IFZ>3ØTHEN121
    Ø                     :REM*112
77Ø IFZ=25ANDZ1=ØTHENZ=15:GOTO7
    9Ø                    :REM*1Ø3
78Ø Z1=Ø                  :REM*152
79Ø MOVSPRWS,BX(Z)+24-(2*(WS-1)
    ),BY(Z)+5Ø            :REM*2Ø9
8ØØ IFZ=19THENZ=29:Z2=1 :REM*51
81Ø IFMC>ØTHENGOSUB143Ø:GOTO76Ø
                          :REM*254
82Ø IFZ=22THENZ=27        :REM*59
83Ø IFZ=29ANDZ2=1THENZ=19
                          :REM*11
84Ø IFPL=1THENF=5:G=8:H=2:GOTO8
    6Ø                    :REM*142
85Ø F=1:G=4:H=1           :REM*195
86Ø FORA=FTOG:IFSP(A)=ZTHENSP(A
    )=Ø:GOSUB145Ø:GOTO88Ø
                          :REM*14
87Ø GOTO91Ø               :REM*177
88Ø COLOR1,H:S(H)=S(H)+1:X=256+
    (16*(S(H)-1)):Y=12Ø+(16*(H-
    1))                   :REM*151
89Ø GSHAPEC3$,X,Y:MP(Z)=Ø:J=BS(
    A):K=1                :REM*21Ø
9ØØ IFJ>ØTHENSPRITEJ,Ø:BS(A)=Ø:
    J=Ø                   :REM*172
91Ø NEXT:COLOR1,PL        :REM*193
92Ø SP(S)=Z:MP(Z)=MP(Z)+1
                          :REM*182
93Ø IFXP=ØTHEN1ØØØ        :REM*197
94Ø FORA=1TO8:IFSP(A)=XPTHENSP(
    A)=Z:MP(Z)=MP(Z)+1    :REM*245
95Ø NEXT:XP=Ø             :REM*133
96Ø FORA=1TO8:IFSP(A)=ZTHENBS(A
    )=BS(S)               :REM*2Ø2
97Ø NEXT:MOVSPRC,BX(Z)+22,BY(Z)
    +5Ø:SPRITEC,1,PL:SPRITE2,Ø:
    GOSUB145Ø             :REM*136
98Ø IFMP(Z)>2THEN1Ø1Ø     :REM*35
99Ø GOTO126Ø              :REM*32
1ØØØ COLOR1,PL:IFMP(Z)=1THENGSH
    APEC3$,BX(Z),BY(Z):SPRITE1
    ,Ø:GOTO126Ø           :REM*7
1Ø1Ø IFPL=1THEN111Ø       :REM*52
1Ø2Ø U=5:IFMP(Z)>2THEN1Ø5Ø
                          :REM*83
1Ø3Ø FORA=5TO8:IFBS(A)=5THENU=6
                          :REM*12
1Ø4Ø NEXT                 :REM*15Ø
1Ø5Ø FORA=5TO8:IFSP(A)=ZTHENBS(
    A)=U:GOTO1Ø7Ø         :REM*35
1Ø6Ø NEXT:GOTO12ØØ        :REM*233
1Ø7Ø IFMP(Z)>2THEN1Ø9Ø :REM*233
1Ø8Ø GOTO1Ø6Ø              :REM*124
1Ø9Ø IFU=5THENSPRITE6,Ø:GOTO1Ø6
    Ø                     :REM*61
11ØØ SPRITE5,Ø:GOTO1Ø6Ø   :REM*2
111Ø U=3:IFMP(Z)>2THEN114Ø
                          :REM*134
112Ø FORA=1TO4:IFBS(A)=3THENU=4
                          :REM*98
113Ø NEXT                 :REM*232
114Ø FORA=1TO4:IFSP(A)=ZTHENBS(
    A)=U:GOTO116Ø         :REM*82
115Ø NEXT:GOTO12ØØ        :REM*54
116Ø IFMP(Z)>2THEN118Ø    :REM*79
117Ø GOTO115Ø             :REM*211
118Ø IFU=3THENSPRITE4,Ø:GOTO115
    Ø                     :REM*124
119Ø SPRITE3,Ø:GOTO115Ø:REM*125
12ØØ GOSUB145Ø:MOVSPRU,BX(Z)+22
    ,BY(Z)+5Ø:SPRITEU,1,PL:SPR
    ITE2,Ø:GOTO126Ø       :REM*2
121Ø IFXP=ØTHENSPRITE1,Ø:A=S:GO
    SUB146Ø:GOTO124Ø      :REM*17
122Ø SPRITE2,Ø:FORA=1TO8:IFSP(A
    )=XPTHENGOSUB146Ø     :REM*63
123Ø NEXT:XP=Ø            :REM*17Ø
124Ø IFH(PL)>3THENGW=1 :REM*228
125Ø GOTO128Ø             :REM*59
126Ø IFK=ØTHEN128Ø        :REM*8
127Ø K=Ø:CHAR1,27,9,"KILLED ENE
    MY",1:GOSUB15ØØ:GOSUB149Ø:
    GOSUB143Ø:GOSUB143Ø:REM*21
128Ø A$="{12 SPACEs}":FORX=ØTO2
    :CHAR1,27,X,A$:CHAR1,27,X+
    7,A$:NEXT             :REM*147
129Ø FORX=216TO292STEP24:GSHAPE
    B1$,X,32:NEXT         :REM*21Ø
13ØØ IFGW=1THEN133Ø       :REM*1Ø2
131Ø IFET>ØTHENET=ET-1:GOSUB149
    Ø:A$="EXTRA TURN":CHAR1,27
    ,Ø,A$,1:GOTO43Ø       :REM*41
132Ø GOTO42Ø              :REM*1Ø4
133Ø GOSUB152Ø            :REM*112
134Ø SCNCLR:A$=PL$(PL)+" IS THE
     WINNER!":CHAR1,1Ø,8,A$
                          :REM*159
135Ø A$="GAME OVER":CHAR1,15,1Ø
    ,A$,1                 :REM*232
136Ø A$="PLAY AGAIN? (Y/N)":CHA
    R1,11,13,A$           :REM*179
137Ø GETA$:IFA$=""THEN137Ø
                          :REM*37
138Ø IFA$="Y"THEN141Ø     :REM*189
139Ø IFA$<>"N"THEN137Ø     :REM*4
14ØØ GRAPHICØ:END         :REM*1Ø9
141Ø SCNCLR:GRAPHICØ:CLR:RESTOR
    E:GOTO1Ø              :REM*151
142Ø CHAR1,27,9,"CHOOSE PIECE",
    B:GOSUB143Ø:RETURN:REM*114
143Ø FORA=1TO3ØØ:NEXT:RETURN
                          :REM*2Ø5
144Ø FORA=1TO8:DP(A)=-1:NEXT:RE
    TURN                  :REM*187
145Ø COLOR1,7:GSHAPEB2$,BX(Z),B
    Y(Z):SPRITE1,Ø:COLOR1,PL:R
    ETURN                 :REM*188
146Ø COLOR1,PL:HM(A)=1:H(PL)=H(
    PL)+1:SP(A)=Z         :REM*171
147Ø X=256+(16*(H(PL)-1)):Y=168
    +(16*(PL-1))          :REM*132
148Ø GSHAPEC3$,X,Y:RETURN
                          :REM*2Ø6
149Ø VOL1Ø:SOUND1,75ØØ,12:SOUND
    1,85ØØ,1Ø:RETURN      :REM*161
15ØØ IFXT=1THENET=ET+1:RETURN
                          :REM*246
151Ø ET=1:RETURN           :REM*45
152Ø FORX=1TO8:SPRITEX,Ø:NEXT:R
    ETURN                 :REM*26
153Ø DATA DOE,GAE,GUL,YOOT,MOE
                          :REM*162
154Ø DATA 184,144,112,8Ø,48,8,1
    44,112,8Ø,48          :REM*25Ø
155Ø DATA 4Ø,64,96,128,152,152,
    128,96,64,4Ø          :REM*74
156Ø SLOW:GRAPHICØ:GOSUB152Ø:PR
    INT"{SHFT CLR}";ERR$(ER),E
    L                     :REM*4
```

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Required Reading

Looking for a good book on Commodore computing? Here's RUN*'s recommended reading list.*

By STÉPHANE DIRSCHAUER

A great profusion of books on computing has appeared in the last few years. And the C-64 and C-128, naturally, have been included. If you want to find out about anything from machine language programming to game-playing tips, you'll find a book—or more likely, books—on the subject.

But there's the rub: Which books are best? To help you answer this question, I prepared this guide to some of the finest books on Commodore computing.

First, a few words about my selection process. There are far too many Commodore-oriented books to include all, or even most, of them here. To keep this article down to an acceptable length, I chose only one or two outstanding books in each subject area. There are doubtless many other good books available, but you can be sure the ones reviewed here are worth buying.

Assembly Advice

Machine Language for the Commodore 64, 128, and other Commodore Computers, by Jim Butterfield, Brady Books/Prentice Hall, 256 pages, $14.95.

Programmers soon discover that Basic isn't suited to serious projects and are eager for something faster and more powerful; that means machine language. Initially, machine language, with its instructions like LDA ($7A),Y, seems undecipherable, but with a good instructor the arcane becomes the obvious. And what better instructor than noted Commodore guru Jim Butterfield?

His book, based on a course developed over five years, provides an excellent introduction to machine language. It differs from its competition by placing more emphasis on the hardware side of the machine: You learn not only what LDA ($7A),Y does, but how it fits into memory and how it's processed. Butterfield first invites you to hand-assemble your commands into the object code used by microprocessors (a job usually relegated to an assembler). Later in the book, a machine language monitor is used to assemble the code, but there's no opportunity to forget the fundamentals.

While it takes an in-depth look at microprocessors and data busses, *Machine Language for the Commodore 64, 128, and other Commodore Computers* is still what its title indicates: a discussion of machine language on any Commodore, be it a PET or C-128. The book doesn't teach specifics, such as graphics and sound, but it does teach enough to make learning those details easy. Moreover, most of it is dedicated to reference materials—memory maps, chip specifications, and even a type-in machine language monitor that provides low-level access to basic computer functions.

Throughout the book, Butterfield's crisp, concise style skillfully untangles the twisted complexities of machine language. I recommend it enthusiastically.

A good second machine language reference book, one with more advanced techniques than found in Butterfield's, is ***The Advanced Machine Language Book for the Commodore 64***, by Lothar Englisch, Abacus Books, 210 pages, $14.95.

It shows how to handle floating-point numbers (and how to get built-in ROM routines to do most of the work), how to accomplish a number of nifty tricks via interrupt requests, and how to add new commands to Basic 2.0. What's more, each section includes annotated source code to clarify the concepts presented. These listings may be the most informative part of the book, since they are actual examples of machine language code you can study and dissect.

If you want to use the techniques mentioned here, you should consider this book. However, keep in mind that it assumes a working knowledge of machine language programming, therefore you'll need a handbook on the fundamentals first.

Weirdware

I Didn't Know You Could Do THAT With A Computer!, by Dan Gutman, COMPUTE! Books, 308 pages, $14.95.

The computer is the most versatile appliance ever created, but you wouldn't know it. Most of the poor things spend their days locked into one of three applications—word processing, number crunching, or game playing. These are all excellent uses for a computer, but they make it too simple to forget that computers can do much more.

With this book, syndicated columnist Dan Gutman serves up a reminder. *I Didn't Know You Could Do THAT With A Computer!* is a surprising look at what Gutman calls "weirdware"—unique and often oddball programs that fill a certain niche. Some are genuinely useful, and some are, well, amusing ways to waste an afternoon. They're not all available for the C-64/128—the book investigates applications for all computers—but thanks to the Commodore's extensive software library, most are.

If you've never used your Commodore to save an endangered species, learn to play the guitar, plant a garden, or read other people's minds (sort of), you still have computing venues to explore, and *I Didn't Know . . .* will tell you about them plus a hundred more. Because of its light and nontechnical style, this book can also be a fun gift for a friend who has recently purchased a home computer.

Bits on Bits

Tips & Tricks for Commodore Computers, edited by Louis F. Sander, TAB Books, 388 pages, $21.95.

Most books on computing are aimed at only a select group of readers; the author must assume the reader's level of knowledge, and stick with that plan. *Tips & Tricks* is one of the few exceptions.

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The tips in it come from Sander's Tips & Tricks column of computing hints, submitted by hundreds of readers of the old *Commodore Magazine*. The collection is impressive: more than 600 tips on everything from telecommunications to program debugging, and over 150 short type-in programs.

Many are intended for a particular audience. Less experienced users, for example, can find explanations of the simple things that manual writers have left out because "everyone knows that." However, among this plethora of tips there's something for everyone with any kind of computing background.

Disks Detailed

Inside Commodore DOS, by Richard Immers and Gerald G. Neufeld, Brady Books/Prentice Hall, 510 pages, $19.95.

Everything you've ever wanted to know about the 1541 disk drive's operating system, but didn't know to ask, is described by Immers and Neufeld in their astoundingly comprehensive guide to the vagaries of GCRs, tracks, sectors, and header blocks. *Inside Commodore DOS* touches on the basic disk commands for new 1541 owners, but quickly proceeds to more advanced information.

It explains how data is organized on disk, including the data DOS usually keeps hidden. It also introduces direct-access commands, which access individual tracks and sectors, letting programs organize their own data instead of relying on normal Commodore files.

The two most interesting and practical chapters are "DOS Protection," which unravels part of the mystery of copy protection, and "Getting Out of Trouble," which describes how to salvage files and disks with accidental deletions and warped jackets. For yet more specifics, the rest of the book is devoted to a memory map of the 1541's own ROM and 46 short type-in disk utility programs.

Like gossip from an insider who travels in high circles, the details in *Inside Commodore DOS* elicit a sense of awe—and it's all potentially useful information.

Brady also publishes the ***1541 User's Guide*** by Gerald Neufeld (420 pages, $19.95), a less advanced 1541 guide.

Technical Tours

Mapping the Commodore 64 & 64C, by Sheldon Leemon, COMPUTE! Books, 324 pages, $18.95.

It's senseless to explore any kind of wilderness without some sort of map (unless you relish hidden quicksand and animal snares). Yet, some programmers plunge into their work without a memory map. Maps describing the functions of various RAM and ROM locations in a computer have been around for a long while. As far as the C-64 is concerned, only one will do: *Mapping the Commodore 64 & 64C*.

Its 300-odd pages document, in sequential order, the function of every purposeful memory location in the computer. Some entries are only a few lines long, others fill several pages and include several program listings. *Mapping* is a reference that serious C-64 programmers can't do without.

The latest edition also includes a 50-page map of the GEOS kernal. This section is, however, no replacement for a dedicated GEOS reference book, and its detail pales in comparison to the first section.

Not to leave C-128 programmers out in the cold, COMPUTE! Books also offers ***Mapping the Commodore 128***, by Ottis R. Cowper, 689 pages, $19.95. This book is similar to its sibling in format, and its almost 700 pages will carry you light years toward making full use of your C-128's talents.

Point-and-Click Programming

The Official GEOS Programmer's Reference Guide, by Berkeley Softworks, Bantam Books, 451 pages, $19.95.

It's a long way from traditional C-64/128 programming to GEOS programming. For one thing, the memory layout is different, and a machine language programmer must contend with all sorts of new routines for disk access, text display and user input. What's more, a different mind-set is required for the "event driven" programming of pull-down menus and dialog boxes that gives the computer's built-in routines more freedom. It is possible to make the switch, but programmers entering the new environment will be lost without a reference book.

And *this* is the reference book. It defines every facet of writing GEOS programs, from the obvious details of dialog boxes and icons, to the more subtle processes and time-saving routines. There's even information on creating input and printer drivers. ►

A Few More for the Shelf

The Home Computer Wars, by Michael S. Tomczyk, COMPUTE! Books, $9.95. An insider's look at the tumultuous early years of Commodore.

Commodore 64/128 Programmer's Reference Guide, Howard W. Sams, $19.95. An invaluable introduction and reference to using your Commodore.

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However, knowledge of machine language is assumed, and some of the source code uses macros—programming shorthand that expresses several instructions in a single word—which won't be familiar to most C-64/128 assemblers.

Berkeley's book is a good investment for owners of geoBasic or BeckerBasic. Still, you should have enough experience with machine language to dissect the examples provided. Coding and debugging is always less tiresome and less time-consuming when you understand the way things work.

Equipment Upkeep

Commodore Care Manual: Diagnosing and Maintaining Your 64 or 128 System, by Chris Morrison and Teresa S. Stover, TAB Books, 205 pages, $16.95.

There's nothing sadder than a sick C-64, and, while many repairs are best left to the experienced technician, the average user can do a lot to head off or cure Commodore illnesses. *Commodore Care Manual* is a complete guide to the care of a Commodore system, including how to maintain every peripheral in an average C-64 or C-128 setup. You'll also find out how to protect equipment from gremlins such as dust, static electricity, and power surges.

Of course, no matter how well you take care of it, your machine may still develop problems. To help troubleshoot predicaments, the book lists a type-in Basic program that tests various components, so you can narrow down the list of possible causes.

For solving problems that don't require technical expertise or special tools—such as sticking keys, poor color displays and unruly modems—the book gives simple directions, with pictures and diagrams to light the way. Its cost will be justified by the savings you'll realize when you save a trip to the repair center.

Even if a problem needs professional treatment, following these procedures will give you an idea what the difficulty is and how it will be repaired.

If you want more technical information, TAB also offers ***Troubleshooting and Repairing Your Commodore 64*** and ***Troubleshooting and Repairing Your C-128***, both by Art Margolis (368 pages, $15.95, and 448 pages, $18.95, respectively). Howard W. Sams & Co. is also a source for repair guides to Commodore equipment.

Gaming Guides & Software Solutions

Lou Sander's Gold Mine: Game Tips for Commodore Users, edited by Louis F. Sander, TAB Books, 352 pages, $19.95.

If you like Lou Sander's Gold Mine column in each issue of *RUN*, you'll love this collection of 1200 tips for all varieties of games—adventure, arcade and role-playing alike. Drawn from the original Gold Mine columns in *Commodore Magazine*, the tips include both playing strategies and insidiously clever ways to profit from program loopholes to make playing (and winning) a snap.

With more than 500 games covered, you'll probably find hints for your favorites. What's more, these hints will often work with the same games on other computers. This book could have been titled *The Complete Computer Gamer's Reference Guide*.

Have you ever wondered how overinventoried adventurers can fit through thin cracks on the side of a mountain? And is there any way, other than wearing a garlic necklace, to ward off vampires? How can an explorer discourage vagabond thieves from pocketing his or her important objects? If these questions have plagued you, you need ***Quest for Clues***, volume 1, edited by Shay Addams, Origin Systems, 188 pages, $24.99 (now available only from *Questbusters: The Adventurer's Journal*).

Such questions (sounding like entries in a bizarre personal advice column) are the type all players of adventure games face. Ever since the very first adventure program, which was aptly christened *Adventure*, eager gamers have been exploring exciting worlds and solving curious puzzles from their keyboards. Dozens of adventure games are released every year, and, for baffled players, dozens of expensive hint books appear also.

For the serious adventure gamer, *Quest for Clues* is an inexpensive alternative to buying all those hint books. It features helpful guides to succeeding at 50 adventure and role-playing games, from Amnesia and Autoduel to Wizard's Crown and Wrath of Denethenor, culled from Addams's *Questbusters* journal. To ensure that you don't unwittingly get more help than you want, important bits are encoded with a simple cipher. One hint, for example, instructs you to "uvso the ipvshmbtt."

What's more, the book contains "The Golden Age of Adventure," a fascinating article on the history of adventure games that makes *Quest for Clues* an even better purchase. ***Quest for Clues II*** and ***Quest for Clues III*** ($24.99 each, available directly from Origin) are also available, each one covering 40 more games.

Interface Information

Electronics Projects for Your Commodore 64 and 128, by John Iovine, TAB Books, 192 pages, $15.95.

Interest in computers and electronics often goes hand in hand; they are complementary disciplines that merge beautifully. In fact, when there's a computer around to accept, analyze, manipulate and send data, electronics projects can rise to a whole new plane of existence. In this book, John Iovine details a few such projects that will work with a C-64, C-128 and even (in many cases) a VIC-20.

Things start off modestly, with a simple LED interface from the user port, but they quickly become more intricate. There are instructions for building a sound digitizer and a biofeedback machine, and even for adding subliminal messages to your TV. Each chapter includes a list of the equipment you'll need, complete with approximate costs and manufacturers' addresses. What's

Addresses & Phone Numbers

Abacus Books (800-451-4319)
PO Box 318
Grand Rapids, MI 49588

Questbusters:
The Adventurer's Journal
PO Box 5845
Tucson, AZ 85703

Bantam Books (800-223-6834)
Dept. DR-77, 666 Fifth Ave.
New York, NY 10103

Brady/Prentice Hall (800-223-2336)
Simon & Schuster
200 Old Tappan Road
Old Tappan, NJ 07675

COMPUTE! Books (800-345-1214)
Chilton Book Company
One Chilton Way
Radnor, PA 19089

Howard W. Sams (317-298-5409)
4300 W. 62 St.
Indianapolis, IN 46268

Origin Systems (800-999-4939)
110 Wild Basin Road
Austin, TX 78746

TAB Books (800-822-8138)
Blue Ridge Summit, PA 17214

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more, there are dozens of programs, some in Basic, others in machine language (in Basic-loader form) to power your projects. And, with enough electronics and programming knowledge, you can expand the basic projects as far as your inventiveness reaches.

Inexplicably, the book also includes two chapters on chaos theory and fractal geometry. The direct link between these and electronics projects is surely tenuous, but the chapters are friendly introductions to the subjects (and provide type-in programs), so they are desirable extras.

ABCs OF CP/M

The C-128 CP/M User's Guide, by Jörg Schieb and Elmar A. Weiler, Abacus Software, 297 pages, $19.95.

CP/M, with its dull-looking A> prompt, looks like the least interesting side of the C-128, but CP/M mode is actually a computer in itself, distinct from the C-64 and 128. While CP/M—*Control Program for Microcomputers*—is now a bit bewhiskered as micro operating systems go, it's still a gateway to thousands of programs.

Part of Abacus's eight-volume C-128 series, *The C-128 CP/M User's Guide* is a gentle tutorial on the venerable operating system. Most of it is aimed at the novice, with a chapter detailing what various peripherals do and reminders to press the RETURN key after commands.

However, more advanced C-64/128 users will find it valuable if they don't have experience with disk-based operating systems like CP/M, MS/DOS and AmigaDOS. The book explains various commands, such as PIP and DIR, writing Submit files and the basics of CP/M file management.

Roughly halfway through, the technical level escalates. One chapter lists a 60-page disassembly in CP/M machine language and examines the MAC and RMAC assemblers. It's a big change from the first part of the book. The volume also includes a listing of CP/M commands, from COPYSYS to XREF, with details on input formats and uses, plus reference sections with extra information on complex commands.

You can't go wrong with *The C-128 CP/M User's Guide*. It introduces the world of CP/M, and it serves up the basics of disk-based operating systems at the same time.

Although this roundup has examined more than a dozen Commodore books, as I mentioned there are many others. What's more, books for computer users in general, and even those intended for owners of other machines, can be useful to the Commodore owner. If you're interested, there's a mountain of knowledge waiting for you to climb. ■

Stéphane Dirschauer is a Commodore expert who writes frequently for RUN.

NOTE: Some books mentioned in this article are currently out of print. This doesn't mean, however, that they're unavailable. Check stores, mail order, user's groups and public libraries for availability.

Big Blue Reader 128/64

Read & Write IBM PC Disks!

Big Blue Reader 128/64 is a **fast, easy-to-use**, menu driven program for novice and expert alike. Transfers word processing, text, ASCII, and binary files between Commodore 64/128 and IBM PC compatible 360K 5.25" and 720K 3.5" disks. Includes both C64 & C128 programs.
Requires 1571 or 1581 Disk Drive. *Does not work using 1541.*
BBR 128 Version 3.1 upgrade, $18+ original BBR disk.

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128 Graphics Wizardry

Discover the color high-resolution potential within your C-128's video display chip.

By LOU WALLACE

When Commodore released the C-128, users long frustrated by the limitations of the 64's 40-column screen were delighted: They finally had 80 columns. Unfortunately, those who were interested in higher resolution graphics were still disappointed. The display chip, which had to accommodate both 40- and 80-column modes, limited 80-column mode to a 320 × 200-pixel text-only display.

But, never fear—enterprising programmers, unwilling to accept the status quo, worked around this limitation and unleashed the C-128's full graphics potential. First they developed 80-column graphics in monochrome, and then they took on color high-resolution bitmap graphics as well.

The Costs of Color

The C-128's 80-column display IC, known as the *video display chip* (VDC), has its own RAM on the computer's motherboard. It is this special VDC RAM (not the standard RAM used for program memory) that stores the 80-column display. The original C-128 came with 16K of VDC RAM, while the newer C-128D has 64K. It's this amount of video RAM in the 128 that determines the size and type of 80-column color bitmap image you can display.

Let's walk through a standard example: we'll examine a 640 × 200-pixel color bitmap image. The monochrome bitmap display requires one bit (on or off) per pixel, which totals 16,000 bytes of RAM for an image of that size (at eight bits per byte). If your C-128 has 16K (that is, 16,384 bytes) of VDC RAM, it has more than enough for the full-screen, monochrome display.

However, when you use color, 16K of VDC memory is just not enough. Here's why. Color bitmap images have two distinct RAM requirements: First, we need RAM for the bitmap image, which we just calculated at 16,000 bytes. Second, RAM is used to store the color information, and the amount required depends upon the size of the color cells used in the display.

With a 64K VDC, you get 200 lines of color (left). With 16K, you only get 176 (right).

A color cell is a single byte of RAM that determines which two colors are displayed in a section of the screen (such as a yellow image on a blue background). Usually the area is an 8 × 8-pixel block, the space allocated for a standard text character.

Using the 8 × 8 color cells, a bitmap display of our example is 80 × 25 cells, for a total of 2000 color cells. At one byte per color cell, the computer needs 2000 bytes of RAM to store the color information for the image.

That 2000 bytes, plus the 16,000 we calculated earlier for the bitmap image, totals 18,000 bytes of RAM for a simple 640 × 200 color bitmap image. And that's certainly more than the 16K available in a standard C-128.

To make matters worse, the C-128 can use smaller color cells (8 × 4 or 8 × 2) to create more intricate displays. This creates even greater RAM requirements. The 8 × 4 mode needs 20,000 bytes, and the 8 × 2 mode requires 24,000 bytes. What's more, with the proper software it's possible to create displays larger than 640 × 200. Sadly, all of these options are beyond the reach of a "plain old" C-128. Of course, the 128D with its factory-installed 64K VDC RAM can do it all.

Making the Up-Grade

The trick, then, is to enhance your 128 with a 64K VDC RAM upgrade chip—no big deal! The easiest way is to purchase a solderless 64K VDC upgrade kit. The best one I know of is the VDC RAM Upgrade Daughter Board from SSI. This kit will let you add the extra RAM without removing the old RAM chips.

All you have to do is take out the VDC chip, insert the small "daughter" board containing the 64K RAM into the VDC socket, then reinsert the old VDC chip into a socket on the new board. The old RAM remains on the motherboard.

While this is a simple operation, it requires opening the computer. If you're not comfortable doing that, your local service center will be glad to do it for you.

Software That Knows How

If you've installed everything correctly, you'll get a surprise when you turn on your computer, because *nothing has changed*. As far as the C-128 knows, it still has only 16K of VDC RAM. To take advantage of the extra RAM, you need software that knows how to access it. Here are some of the best commercial programs that do.

One powerful package is **I Paint** from Voyager Mindtools. This paint program gives you an incredible 640 × 400 interlaced color display on the C-128. Interlacing is the same technique used on the Amiga to create 400-line displays. As with the Amiga, interlaced displays on the C-128 exhibit a noticeable flicker, the amount of which varies from one monitor to another.

Another package for the upgrade is Free Spirit's **Basic 8** (which I helped develop). It includes a graphics programming language, a runtime library, a paint ►

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program and other utilities and programs. Basic 8 fully supports both the 64K VDC RAM upgrade and the older 16K system, offering various graphics modes and screen sizes and several exotic commands. Free Spirit also offers a paint program for the enhanced C-128, **Spectrum 128**, that works in 8 × 2 color cell mode.

SilvaSoft has a newer 80-column paint program called **Masterpaint**. It requires 64K of VDC RAM and works in the 8 × 2 color-cell mode. Further, they publish an animated graphics adventure called **Maidstone Quest**, that supports the upgrade.

Star Follower Productions publishes **Ante Up**, a utility that converts pictures among a wide variety of programs, including Basic 8 and GEOS.

Software Support International (SSI), producer of the VDC RAM Upgrade Daughter Board, puts out **Fastrac 128** and **Maverick**, disk copy programs that can take advantage of the 64K VDC RAM.

So take heart, hi-res hackers. Now there's hardware *and* software that can, graphically speaking, make your Commodore life much more exciting. ■

Lou Wallace, co-author of Basic 8, is Senior Editor, Technology, for RUN*'s sister publication* AmigaWorld.

Addresses & Prices

Free Spirit Software
Available from Briwall
800-638-5757 (USA only)
PO Box 129
Kutztown, PA 19530
- ***Basic 8***, $35
- ***Spectrum 128***, $39.95

Silvasoft
PO Box 1006
Charlotte, VT 05445
- ***Masterpaint***, $28.50
- ***Maidstone Quest***, $28.50

Software Support International (SSI)
800-356-1179
2700 N.E. Andresen Road, Suite A10
Vancouver, WA 98661
- ***VDC RAM Upgrade Daughter Board***, $49.95
- ***Fastrac 128***, $34.95
- ***Maverick***, $39.95

Star Follower Productions
4224 Bakman
North Hollywood, CA 91602
- ***Ante Up***, $20

Voyager Mindtools
PO Box 11578
Minneapolis, MN 55411
- ***I Paint***, $39.95

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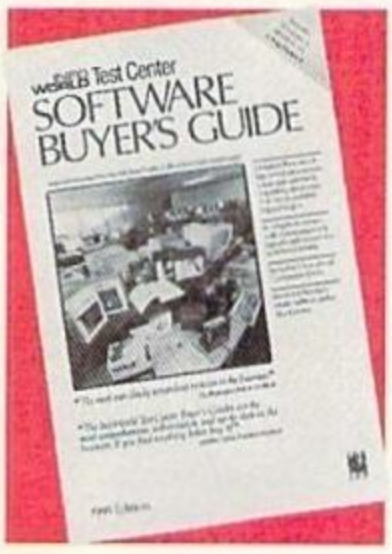

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Roadtest 64

Compete to take first place as you test your knowledge of traffic signs & travel facts.

By PETER LOTTRUP

Maybe you've been driving for years, but do you know what green road signs mean? How about a yellow sign with a T on it? If you traveled to Missouri, would you know the name of the capital city? Test your street smarts with Roadtest 64, an entertaining and educational one- or two-player game.

Type in Roadtest 64 from Listing 1, using *RUN*'s Checksum on page 60 to catch typing errors, then save it. The program is written in Basic, so simply run it, select the number of players, and the race is on!

In a one-player game, you try to reach the finish line in the least number of turns. In a two-player game, the blue and red cars compete, and the first one to reach the finish line wins.

Colorful Questions

In two-player games, the first car to move is selected randomly, then they alternate. Each turn, your car will advance either one or two squares, also selected randomly. Once it advances, you answer a question from one of three categories, determined by the color your car lands on. The categories are:

- *Blue*—What does a specific road sign mean? You have three choices.
- *Red*—What type of road sign is a certain color? Here, too, you have three choices.
- *Green*—What is a given state's capital or a capital's state? You must type in the name correctly.

If you answer correctly, your car stays where it is. If you don't, it returns to where it was at the beginning of your turn. You won't see the correct answer displayed. Instead, the same question might be asked again later. Questions answered correctly aren't repeated until all of the other questions in the category have been used. The first car to reach the finish line is the winner, and is heralded with the appropriate fanfare.

There are currently 20 states and state capitals in the game. If you wish to add more, increase variable BL in line 20 by the additional number. Then add the Data statements to the end of the program, following the pattern of those that are built in.

So, let's see . . . is Bismark the capital of North . . . or South Dakota? R

Peter Lottrup, software developer and author of books on assembly language and Pascal programming, is head of the Computer Studies Department at the Northlands School in Buenos Aires, Argentina.

Listing 1. Road Test program. (Available on the July/August ReRUN disk. To order call 800-343-0728.)

```
Ø REM ROAD TEST          :REM*21Ø
1Ø BL=2Ø:SP$="":FORI=1TO29:SP$=
   SP$+" ":NEXT          :REM*136
2Ø GR=11:BR=15:GOSUB119Ø :REM*2
3Ø DIMGR$(GR),BR$(BR),BL$(BL,2)
   ,V$(25),GR(GR),BR(BR),BL(BL)
                         :REM*191
4Ø FORI=1TOGR:READGR$(I):NEXT
                         :REM*69
5Ø FORI=1TOBR:READA,B$:BR$(I)=C
   HR$(A)+B$:NEXT        :REM*244
6Ø FORI=1TOBL:READBL$(I,1),BL$(
   I,2):NEXT             :REM*185
7Ø POKE5328Ø,Ø:POKE53281,Ø:X=RN
   D(-TI)                :REM*27
8Ø PRINT"{SHFT CLR}{COMD 7}";
                         :REM*93
9Ø V$(Ø)="{HOME}":FORI=1TO25:V$
   (I)=V$(I-1)+"{CRSR DN}":NEXT
                         :REM*212
1ØØ S=53248:POKES+21,Ø:POKE2Ø4Ø
   ,13:POKE2Ø41,13:POKES+39,6:
   POKES+4Ø,2            :REM*1Ø1
11Ø POKES+16,Ø:DM=1:X2=Ø:FORE=1
   TO8:H=H(E):U=U(E):X2=X2+1:G
   OSUB74Ø:NEXT:DM=Ø     :REM*113
12Ø POKES,Ø:POKES+1,145:SG$="RO
   AD TEST!":PRINTV$(12)TAB(15
   )"{CTRL 3}";:J=Ø      :REM*247
13Ø A=1:B=15Ø:GOSUB134Ø:REM*133
14Ø FORI=1TO1ØØ:POKE5328Ø,I:NEX
   T:POKE5328Ø,Ø:K=Ø     :REM*76
15Ø PRINTV$(12)TAB(1Ø)"(1) OR (
   2) PLAYERS ?"         :REM*145
16Ø GETCA$:IFCA$<>"1"ANDCA$<>"2
   "THEN16Ø              :REM*2Ø3
17Ø L1$="":FORI=1TO38:L1$=L1$+"
   {SHFT *}":NEXT        :REM*64
18Ø PRINT"{SHFT CLR}{CRSR DN}";
   :B$(1)="{CTRL 3}{CTRL 9}{2
   SPACEs}":B$(2)="{CTRL 7}{CT
   RL 9}{2 SPACEs}":B$(3)="{CT
   RL 6}{CTRL 9}{2 SPACEs}":P1
   $="":S1$=""           :REM*126
19Ø FORI=1TO4:FORJ=1TO3:P1$=P1$
   +CHR$(J)              :REM*168
2ØØ S1$=S1$+B$(J)+"{CTRL Ø} ":N
   EXTJ,I                :REM*222
21Ø PRINTV$(4)"{3 CRSR RTs}"S1$
   "{HOME}{CTRL 2}"V$(1)"{CTRL
    Ø}{COMD 4}"L1$V$(3)L1$
                         :REM*169
22Ø IFCA$="2"THENPRINTV$(6)"{CT
   RL Ø}{COMD 4}"L1$V$(8)L1$V$
   (9)"{3 CRSR RTs}"S1$
                         :REM*15Ø
23Ø POKES,24:POKES+1,68:POKES+2
   ,24:POKES+3,1Ø8       :REM*2Ø5
24Ø PT(1)=Ø:PT(2)=Ø      :REM*34
25Ø POKES+21,1:IFCA$="2"THENPOK
   ES+21,3               :REM*35
26Ø PL=1:IFCA$="2"ANDRND(1)<.5T
   HENPL=2               :REM*2Ø3
27Ø GOSUB116Ø            :REM*92
28Ø FL=1:FORI=1TOGR:IFGR(I)=ØTH
   ENFL=Ø                :REM*151
29Ø NEXTI:IFFLTHENFORI=1TOGR:GR
   (I)=Ø:NEXT            :REM*1ØØ
3ØØ FL=1:FORI=1TOBL:IFBL(I)=ØTH
   ENFL=Ø                :REM*127
31Ø NEXTI:IFFLTHENFORI=1TOBL:BL
   (I)=Ø:NEXT            :REM*177
32Ø FL=1:FORI=1TOBR:IFBR(I)=ØTH
   ENFL=Ø                :REM*58
33Ø NEXTI:IFFLTHENFORI=1TOBR:BR
   (I)=Ø:NEXT            :REM*2Ø4
34Ø PRINTV$(16)TAB(5);:IFPL=1TH
   ENPRINT"{COMD 7}BLUE ";
                         :REM*114
35Ø IFPL=2THENPRINT"{COMD 3}RED
    ";                   :REM*2Ø7
36Ø PRINT"DRIVER"         :REM*98
37Ø A1=Ø:A2=1:A3=254:IFPL=2THEN
   A1=2:A2=2:A3=253      :REM*52
```


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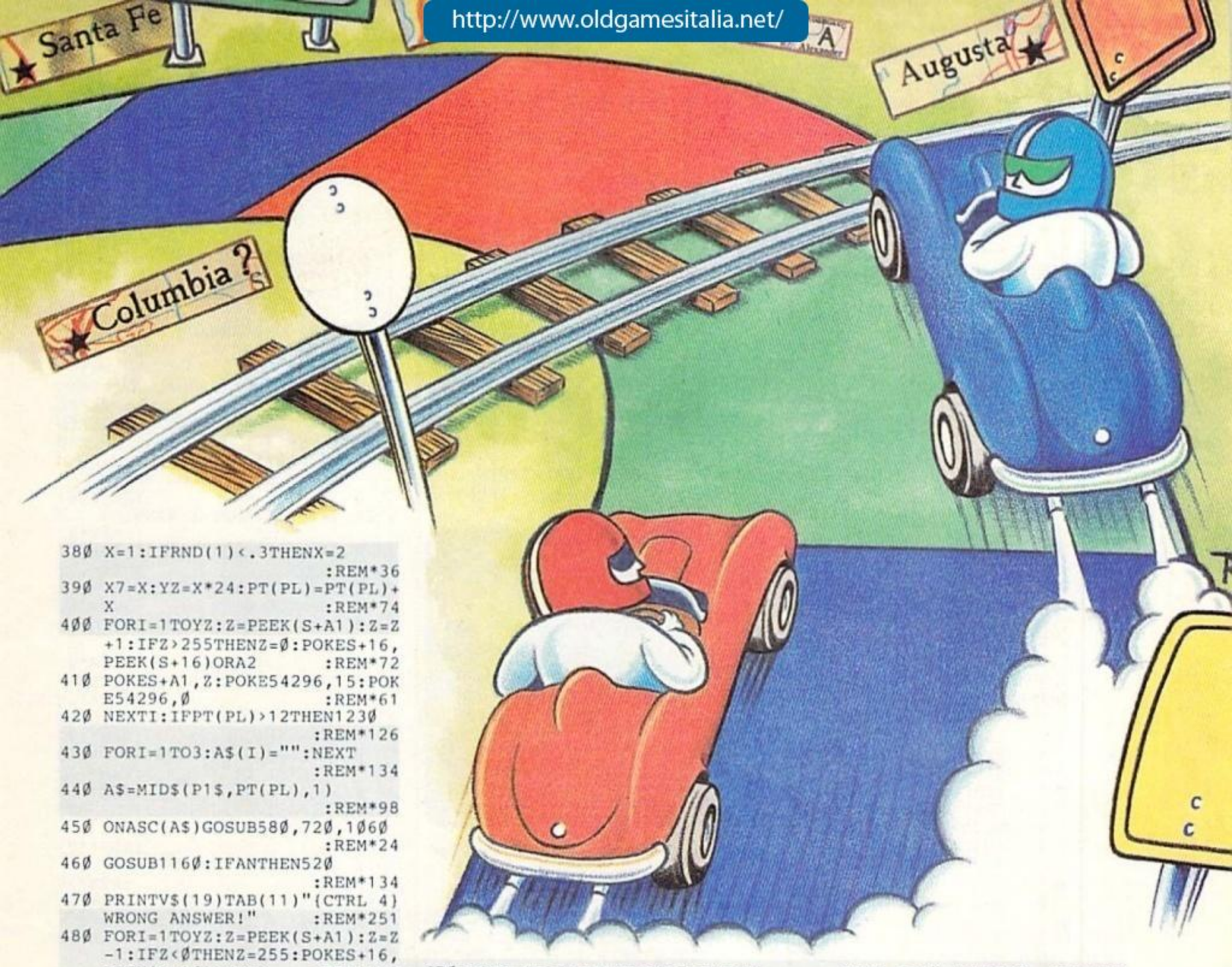


```
38Ø X=1:IFRND(1)<.3THENX=2
                          :REM*36
39Ø X7=X:YZ=X*24:PT(PL)=PT(PL)+
    X                     :REM*74
4ØØ FORI=1TOYZ:Z=PEEK(S+A1):Z=Z
    +1:IFZ>255THENZ=Ø:POKES+16,
    PEEK(S+16)ORA2        :REM*72
41Ø POKES+A1,Z:POKE54296,15:POK
    E54296,Ø              :REM*61
42Ø NEXTI:IFPT(PL)>12THEN123Ø
                          :REM*126
43Ø FORI=1TO3:A$(I)="":NEXT
                          :REM*134
44Ø A$=MID$(P1$,PT(PL),1)
                          :REM*98
45Ø ONASC(A$)GOSUB58Ø,72Ø,1Ø6Ø
                          :REM*24
46Ø GOSUB116Ø:IFANTHEN52Ø
                          :REM*134
47Ø PRINTV$(19)TAB(11)"{CTRL 4}
    WRONG ANSWER!"        :REM*251
48Ø FORI=1TOYZ:Z=PEEK(S+A1):Z=Z
    -1:IFZ<ØTHENZ=255:POKES+16,
    PEEK(S+16)ANDA3       :REM*193
49Ø POKES+A1,Z:POKE54296,15:POK
    E54296,Ø              :REM*237
5ØØ NEXTI                 :REM*11
51Ø PT(PL)=PT(PL)-X7:GOTO56Ø
                          :REM*219
52Ø PRINTV$(19)TAB(14)"{CTRL 4}
    CORRECT!"             :REM*175
53Ø POKE54273,7Ø:POKE54278,249:
    POKE54296,15:POKE54276,17:P
    OKE54276,16           :REM*45
54Ø FORDY=1TO5ØØ:NEXT:POKE54273
    ,Ø                    :REM*193
55Ø FORDY=1TO1ØØØ:NEXT    :REM*214
56Ø IFCA$="1"THENK=K+1:GOTO27Ø
                          :REM*127
57Ø PL=NOT(PL)-4:GOTO27Ø:REM*1Ø
58Ø X2=INT(RND(1)*BR)+1:IFBR(X2
    )THEN58Ø              :REM*62
59Ø AN$=MID$(BR$(X2),2):POKE646
    ,ASC(BR$(X2))         :REM*5Ø
6ØØ FORI=18TO21:PRINTV$(I)TAB(5
    )"{CTRL 9}{4 SPACEs}":NEXT
                          :REM*197
61Ø XX=INT(RND(1)*3)+1:A$(XX)=A
    N$                    :REM*127
62Ø A=Ø:FORJ=1TO3:IFA$(J)<>""TH
    EN65Ø                 :REM*154
63Ø YY=INT(RND(1)*BR)+1:B=ASC(B
    R$(YY)):IFB=PEEK(646)ORB=AT
    HEN63Ø                :REM*174
64Ø A$(J)=MID$(BR$(YY),2):A=ASC
    (BR$(YY))             :REM*214
65Ø NEXT                  :REM*15
66Ø A$="":POKE198,Ø       :REM*17Ø
67Ø FORI=1TO3:PRINTV$(17+I)TAB(
    9)"{CTRL 8}"STR$(I)") {CTRL
     7}"A$(I):NEXT        :REM*113
68Ø GETA$:IFA$<"1"ORA$>"3"THEN6
    8Ø                    :REM*239
69Ø AN=Ø                  :REM*99
7ØØ IFVAL(A$)=XXTHENAN=1:BR(X2)
    =1                    :REM*25Ø
71Ø RETURN                :REM*87
72Ø H=17:U=27:X2=INT(RND(1)*GR)
    +1:IFGR(X2)THEN72Ø    :REM*37
73Ø AN$=MID$(GR$(X2),2)   :REM*3Ø
74Ø A$="{CTRL 9}{SHFT LB.}":B$=
    "{CTRL 9}{COMD *}":C$="{CTR
    L Ø}{COMD *}{CTRL 9}":D$="{
    CTRL Ø}{SHFT LB.}{CTRL 9}":
    S$=""                 :REM*123
75Ø X=U:FORI=1TO4:PRINTV$(H-3+I
    )TAB(X)"{CTRL 8}"A$S$B$:X=X
    -1:S$=S$+"{2 SPACEs}":NEXTI
                          :REM*2Ø4
76Ø S$="{6 SPACEs}":X=X+1
                          :REM*13
77Ø FORI=5TO8:PRINTV$(H-3+I)TAB
    (X)"{CTRL 8}"C$S$D$:X=X+1:S
    $=MID$(S$,3):NEXTI    :REM*52
78Ø ONX2GOTO79Ø,8ØØ,82Ø,83Ø,85Ø
    ,87Ø,88Ø,89Ø,91Ø,93Ø,95Ø
                          :REM*31
79Ø PRINTV$(H+3)TAB(U)"{CTRL Ø}
     {CRSR UP}{CRSR LF} {CRSR U
    P}{CRSR LF} {2 COMD Is}{CRS
    R LF}{CRSR UP}{COMD *}{CRSR
     DN}{CRSR LF}{CTRL 9}{SHFT
    LB.}"V$(H)TAB(U)"{CTRL 9}{2
     COMD Ps}":GOTO96Ø    :REM*136
8ØØ FORI=HTOH+3:PRINTV$(I)TAB(U
    )"{CTRL Ø} ":NEXT:PRINTV$(H
    +1)TAB(U+1)"{CTRL 9}{2 COMD
     Os}"                 :REM*22
81Ø PRINTV$(H+2)TAB(U+1)"{CTRL
    9}{2 COMD Ys}":GOTO96Ø
                          :REM*146
82Ø PRINTV$(H+1)TAB(U-1)"{CTRL
    Ø}{4 SPACEs}"V$(H+2)TAB(U)"
    {COMD J}{CTRL 9}{COMD K}{CR
    SR DN}{2 CRSR LFs}{CTRL Ø}{
    COMD J}{CTRL 9}{COMD K}":GO
    TO96Ø                 :REM*213
83Ø PRINTV$(H+2)TAB(U)"{CTRL 9}
    {COMD L}{COMD J}{CRSR DN}{2
     CRSR LFs}{COMD L}{COMD J}"
    V$(H)TAB(U-1)"{COMD D}{2 SP
    ACEs}{COMD F}"        :REM*46
84Ø PRINTV$(H+1)TAB(U)"{CTRL 9}
    {COMD B}{CTRL Ø}{COMD B}":G
    OTO96Ø                :REM*54
85Ø FORI=HTOH+3:PRINTV$(I)TAB(U
    )"{CTRL Ø}{COMD K}{CTRL 9}{
    COMD K}":NEXT         :REM*7
86Ø PRINTV$(H+1)TAB(U-1)"{CTRL
    9}{COMD I}{CTRL Ø}{COMD V}{
    COMD C}{CTRL 9}{COMD I}"V$(
    H+2)TAB(U-1)"{CTRL Ø}{COMD
    I}{COMD F}{COMD D}{COMD I}"
    :GOTO96Ø              :REM*95
87Ø PRINTV$(H+3)TAB(U)"{CTRL Ø}
     {CRSR UP}{CRSR LF}{2 SPACE
    s}{CTRL 9}{COMD K}{CRSR UP}
    {2 CRSR LFs}{CTRL Ø}{COMD K ►
```

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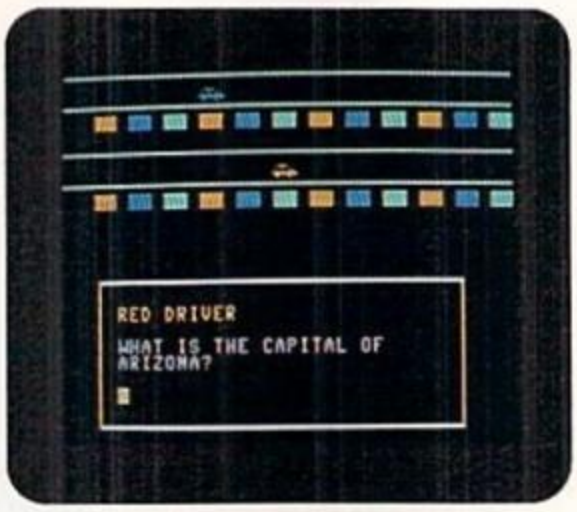
ROADTEST 64

```
    }{CTRL 9}{COMD K}"V$(H)TAB(
    U+1)"{CTRL Ø}{SHFT LB.}{COM
    D *}":GOTO96Ø        :REM*2Ø3
88Ø PRINTV$(H)TAB(U+1)"{CTRL 9}
    {UP ARROW}{CRSR DN}{CRSR LF
    }{SHFT K}{2 CRSR LFs}{SHFT
    U}{CRSR DN}{CRSR LF}{SHFT J
    }{SHFT I}{CRSR DN}{CRSR LF}
    {SHFT K}{2 CRSR LFs}{SHFT U
    }":GOTO96Ø           :REM*154
89Ø PRINTV$(H+2)TAB(U-2)"{CTRL
    9}12'-6"CHR$(34):POKE212,Ø
                         :REM*4
9ØØ PRINTV$(H)TAB(U)"{CTRL Ø}{S
    HFT LB.}{COMD *}{CRSR DN}{2
     CRSR LFs}{CTRL 9}{COMD C}{
    COMD V}"V$(H+4)TAB(U)"{CTRL
     9}{COMD *}{SHFT LB.}{CRSR
    UP}{2 CRSR LFs}{CTRL 9}{COM
    D D}{COMD F}":GOTO96Ø
                         :REM*1Ø8
91Ø PRINTV$(H)TAB(U)"{SHFT LB.}
    {COMD *}":FORI=H+1TOH+3:PRI
    NTV$(I)TAB(U)"{CTRL 9}{COMD
     L}{COMD J}":NEXT    :REM*99
92Ø PRINTV$(H+2)TAB(U+1)"{CTRL
    Ø}{COMD C}{CTRL 9}{CRSR DN}
    {COMD B}":GOTO96Ø    :REM*18
93Ø FORI=HTOH+3:PRINTV$(I)TAB(U
    )"{CTRL 9}{SHFT -}":NEXT
                         :REM*157
94Ø PRINTV$(H)TAB(U+1)"{CTRL 9}
    {COMD H}{CRSR DN}{CRSR LF}{
    COMD H}{CRSR DN}{CRSR LF}{S
    HFT M}{CRSR DN}{CRSR LF}{CO
    MD N}":GOTO96Ø       :REM*254
95Ø PRINTV$(H)TAB(U+1)"{CTRL 3}
    {CTRL Ø}{SHFT Q}{CRSR DN}{C
    RSR LF}{CTRL 8}{SHFT Q}{CRS
    R DN}{CRSR LF}{CTRL 6}{SHFT
     Q}"                 :REM*57
96Ø IFDMTHENRETURN       :REM*23
97Ø W=INT(RND(1)*3)+1:A$(W)=GR$
    (X2)                 :REM*23Ø
98Ø A=Ø:FORI=1TO3:IFA$(I)<>""TH
    EN1Ø1Ø               :REM*32
99Ø X=INT(RND(1)*GR)+1:IFX=X2OR
    X=ATHEN99Ø           :REM*232
1ØØØ A$(I)=GR$(X):A=X    :REM*83
1Ø1Ø NEXT                :REM*112
1Ø2Ø FORI=18TO2Ø:PRINTV$(I)TAB(
    4)"{CTRL 8}"STR$(I-17)") {
    CTRL 7}"A$(I-17):NEXT
                         :REM*211
1Ø3Ø GETA$:IFA$<"1"ORA$>"3"THEN
    1Ø3Ø                 :REM*212
1Ø4Ø AN=Ø:IFVAL(A$)=WTHENAN=1:G
    R(X2)=1              :REM*115
1Ø5Ø RETURN              :REM*172
1Ø6Ø XX=INT(RND(1)*BL)+1:IFBL(X
    X)THEN1Ø6Ø           :REM*211
1Ø7Ø IFRND(1)<.5THEN112Ø:REM*3Ø
1Ø8Ø PRINTV$(18)TAB(5)"{COMD 7}
    WHAT IS THE CAPITAL OF "V$
    (19)TAB(5)BL$(XX,1)"?"
                         :REM*63
1Ø9Ø GOSUB156Ø           :REM*159
11ØØ AN=Ø:IFAN$=BL$(XX,2)THENAN
    =1:BL(XX)=1          :REM*47
111Ø RETURN              :REM*224
112Ø PRINTV$(18)TAB(5)"{COMD 7}
    THE CAPITAL OF WHAT STATE
    IS"V$(19)TAB(5)BL$(XX,2)"?
    "                    :REM*85
113Ø GOSUB156Ø           :REM*199
114Ø AN=Ø:IFAN$=BL$(XX,1)THENAN
    =1:BL(XX)=1          :REM*1
115Ø RETURN              :REM*9
116Ø PRINTV$(14)TAB(3)"{COMD 8}
    {COMD A}"MID$(L1$,1Ø)"{COM
    D S}"                :REM*232
117Ø FORI=15TO22:PRINTV$(I)TAB(
    3)"{SHFT -}"SP$"{SHFT -}":
    NEXT                 :REM*217
118Ø PRINTV$(23)TAB(3)"{COMD 8}
    {COMD Z}"MID$(L1$,1Ø)"{COM
    D X}":RETURN         :REM*234
119Ø FORI=832TOI+63:POKEI,Ø:NEX
    T                    :REM*228
12ØØ FORI=ØTO23:READA:POKE832+I
    ,A:NEXT              :REM*127
121Ø FORI=1TO8:READH(I),U(I):NE
    XT                   :REM*1Ø3
122Ø RETURN              :REM*87
123Ø POKES+39,6:IFPL=2THENPOKES
    +39,2                :REM*1Ø7
```



Race to glory as you quiz your knowledge of state capitals with Roadtest 64.

```
124Ø POKES+21,Ø:POKES,5Ø:POKES+
    1,145:POKES+16,Ø:SG$="AND
    THE WINNER IS: "     :REM*24Ø
125Ø IFCA$="1"THEN131Ø   :REM*181
126Ø PRINT"{SHFT CLR}{CTRL 5}"V
    $(12)TAB(1Ø);:J=Ø:A=5Ø:B=9
    6:GOSUB134Ø          :REM*31
127Ø O$(1)="BLUE":O$(2)="RED"
                         :REM*98
128Ø SG$="THE "+O$(PL)+" DRIVER
    !":POKES,5Ø:POKES+1,161:PR
    INTV$(14)TAB(1Ø);    :REM*85
129Ø POKE646,6:IFPL=2THENPOKE64
    6,2                  :REM*16Ø
13ØØ J=Ø:GOSUB134Ø:GOTO133Ø
                         :REM*89
131Ø SG$="YOU WON IN"+STR$(K)+"
     TURNS!":POKES+1,145:POKES
    ,1                   :REM*233
132Ø PRINT"{SHFT CLR}{CTRL 5}"V
    $(12)TAB(1Ø);:J=Ø:A=5Ø:B=1
    ØØ:GOSUB134Ø         :REM*18
133Ø FORDY=1TO2ØØØ:NEXT:GOTO7Ø
                         :REM*166
134Ø POKES,A:POKES+21,1:FORI=AT
    O254:X=PEEK(S):POKES,X+1:P
    OKE54296,15          :REM*54
135Ø POKE54296,Ø:IFX>BANDX/8=IN
    T(X/8)THENJ=J+1:PRINTMID$(
    SG$,J,1);            :REM*152
136Ø NEXT:POKES+21,Ø:RETURN
                         :REM*128
137Ø DATAØ,Ø,Ø,31,192,Ø,34,32,Ø
    ,66,28,Ø             :REM*173
138Ø DATA255,255,Ø,255,255,128,
    56,56,Ø,16,16,Ø      :REM*112
139Ø DATA5,5,5,14,5,23,5,32
                         :REM*245
14ØØ DATA16,5,16,14,16,23,16,32
                         :REM*186
141Ø DATA SHARP RIGHT TURN
                         :REM*235
142Ø DATA SIDEROAD       :REM*1Ø4
143Ø DATA T INTERSECTION:REM*99
144Ø DATA Y INTERSECTION
                         :REM*127
145Ø DATA CROSSROADS     :REM*183
146Ø DATA SHARP R&L TURNS
                         :REM*177
147Ø DATA WINDING ROAD,OVERPASS
                         :REM*56
148Ø DATA MERGE,MERGE LEFT,SIGN
    AL AHEAD             :REM*Ø
149Ø DATA 2,STOP,2,YIELD,2,DO N
    OT ENTER,2,WRONG WAY
                         :REM*164
15ØØ DATA 7,GENERAL WARNING
                         :REM*81
151Ø DATA 1,REGULATORY,1,SPEED
    LIMIT                :REM*177
152Ø DATA 8,CONSTRUCTION,8,MAIN
    TENANCE WORK         :REM*12
153Ø DATA 5,GUIDE INFORMATION,5
    ,DISTANCE,5,DIRECTION
                         :REM*41
154Ø DATA 6,MOTORIST SERVICES
                         :REM*124
155Ø DATA 9,RECREATIONAL,9,CULT
    URAL INTERESTS       :REM*147
156Ø POKE2Ø4,Ø:PRINTV$(21)TAB(5
    )"{CTRL 8}";         :REM*122
157Ø AN$=""              :REM*162
158Ø GETA$:IFA$=CHR$(13)THENPRI
    NT" ":POKE2Ø4,1:RETURN
                         :REM*1Ø1
159Ø IFA$=CHR$(2Ø)THEN164Ø
                         :REM*34
16ØØ IFA$=" "THEN162Ø    :REM*86
161Ø IFA$<"A"ORA$>"Z"THEN158Ø
                         :REM*99
162Ø IFLEN(AN$)>27THEN158Ø
                         :REM*24Ø
163Ø PRINTA$;:AN$=AN$+A$:GOTO15
    8Ø                   :REM*Ø
164Ø IFAN$=""THEN158Ø    :REM*213
165Ø AN$=LEFT$(AN$,LEN(AN$)-1):
    PRINT"{CRSR LF}{2 SPACEs}{
    2 CRSR LFs}";:GOTO158Ø
                         :REM*164
166Ø POKE54273,7Ø:POKE54278,249
    :POKE54296,15:POKE54276,17
    :POKE54276,16        :REM*95
167Ø FORDY=1TO5ØØ:NEXT:POKE5427
    3,Ø:RETURN           :REM*23
168Ø DATA FLORIDA,TALLAHASSEE,N
    EW YORK,ALBANY       :REM*9Ø
169Ø DATA CALIFORNIA,SACRAMENTO
    ,COLORADO,DENVER     :REM*175
17ØØ DATA GEORGIA,ATLANTA,WISCO
    NSIN,MADISON         :REM*162
171Ø DATA WASHINGTON,OLYMPIA,MI
    CHIGAN,LANSING       :REM*164
172Ø DATA UTAH,SALT LAKE CITY,W
    YOMING,CHEYENNE      :REM*185
173Ø DATA ILLINOIS,SPRINGFIELD,
    ARKANSAS,LITTLE ROCK
                         :REM*252
174Ø DATA ALABAMA,MONTGOMERY,AR
    IZONA,PHOENIX        :REM*213
175Ø DATA IDAHO,BOISE,TENNESSEE
    ,NASHVILLE           :REM*34
176Ø DATA VIRGINIA,RICHMOND,MIS
    SOURI,JEFFERSON CITY
                         :REM*121
177Ø DATA IOWA,DES MOINES,MISSI
    SSIPPI,JACKSON       :REM*119 ■
```

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Super Keys

Put your function keys to work with this versatile programming utility.

By MICHAEL REBELLA

Function keys are a basic, but not *Basic*, part of C-64 computing. That is, they haven't been until now. With Super Keys, you can program the F1–F8 keys to execute commands from within Basic.

Type in the program from Listing 1, using *RUN*'s Checksum program on page 60 to detect any typing errors, then save it. When you run Super Keys, the machine language code found in the Data statements will be poked into memory and enabled. You can then enter NEW (by pressing F4 and RETURN) to erase the Basic program; the machine language that handles the function keys will not be affected until you turn your computer off.

The commands that are built into the program are:

F1—Poke background color
F2—Poke border color
F3—Load directory
F4—Clear screen
F5—Save "
F6—SYS
F7—List
F8—Load "

With the machine language in memory, just press the appropriate key to execute any of these commands.

Customizing Super Keys

This program is simple to adapt. Create several versions to meet your various needs by changing the commands in lines 20–90. M$(1) in line 20 controls the F1 key, M$(2) in line 30 controls the F2 key, and so forth.

When changing these lines, note that each command can be no longer than eight characters, so it may be necessary to abbreviate. This is illustrated in lines 20 and 30, where P{SHIFT}/O is used instead of POKE.

If you wish to have a command executed immediately, add +CHR$(13) to the end of the string, as was done in lines 40 and 50. The computer will interpret the +CHR$(13) as a return. Be sure to count the return as one character when checking the length. Omit the return with commands requiring more information before they execute, such as Save, Poke and SYS, or if a command should be verified before executing, such as New. To insert a quotation mark, add +CHR$(34), as in line 60. This also counts as one character.

Super Keys is especially helpful when using several machine language programs. Rather than remembering each SYS address, you can enter them on your function keys. For example, you might change line 20 to:

```
20 M$(1) = "S{SHIFT Y}49152"
```

From now on when you're programming in Basic, don't think of your function keys as useless. Instead, transform them into Super Keys, and put them to work. R

Michael Rebella, who is a recent graduate in computer science from the University of Minnesota, writes Basic and assembly language programs for the C-64.

Listing 1. Super Keys program. (Also available on the July/August ReRUN disk. To order, call 800-343-0728.)

```
10 REM 64 FUNCTION KEYS :REM*72
20 M$(1) = "P{SHFT O}53281,"
                        :REM*74
30 M$(2) = "P{SHFT O}53280,"
                        :REM*74
40 M$(3) = "L{SHFT O}"+CHR$(34)
   +"$"+CHR$(34)+",8"+CHR$(13)
                        :REM*44
50 M$(4) = "PRINT"+CHR$(147)+CH
   R$(13)               :REM*81
60 M$(5) = "SAVE "+CHR$(34)
                        :REM*202
70 M$(6) = "SYS "       :REM*21
80 M$(7) = "LIST "+CHR$(13)
                        :REM*68
90 M$(8) = "LOAD "+CHR$(34)
                        :REM*167
100 REM PRINT COMMANDS :REM*191
110 FOR I =1 TO 8:READ A:O(I)=A
    :NEXT               :REM*215
120 DATA 7,1,3,5,8,2,4,6
                        :REM*129
130 REM ML PROGRAM      :REM*30
140 FOR I =53000 TO 53094:READ
    A:POKE I,A:NEXT I   :REM*59
150 REM POKE MESSAGES INTO MEMO
    RY                  :REM*195
160 FOR J=1 TO 8        :REM*26
170 M$(O(J)) = LEFT$(M$(O(J)),8
    )                   :REM*242
180 T$ = M$(O(J))       :REM*145
190 FOR I=I TO I+7      :REM*67
200 POKE I,ASC(T$+CHR$(0))
                        :REM*36
210 IF T$ <> "" THEN T$ = RIGHT
    $(T$,(LEN(T$)-1))   :REM*99
220 NEXT I: NEXT J      :REM*30
230 REM POKE MESSAGES INTO MEMO
    RY                  :REM*179
240 FOR J =1 TO 8       :REM*106
250 POKE I,LEN(M$(O(J))):REM*81
260 I = I+1             :REM*46
270 NEXT J              :REM*38
280 SYS 53000: REM ENABLE FUNCT
    ION KEYS            :REM*63
290 DATA 120,169,21,141,20,3,16
    9,207,141,21,3,88,96,165,19
    7,205,86,207        :REM*192
300 DATA 240,55,141,86,207,56,2
    33,3,201,4,176,45,166,212,2
    08,41,174,141       :REM*248
310 DATA 2,240,3,24,105,4,168,1
    85,167,207,133,198,152,10,1
    68,185,87,207       :REM*52
320 DATA 133,251,185,88,207,133
    ,252,160,0,177,251,240,8,15
    3,119,2,200         :REM*221
330 DATA 192,8,208,244,76,49,23
    4,0,103,207,111,207,119,207
    ,127,207,135        :REM*247
340 DATA 207,143,207,151,207,15
    9,207               :REM*195 ■
```


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GEOWATCH

This time geoWatch and ProTips have been combined to give you inside hints for getting the most from GEOS and GEOS applications.

Compiled By JANICE GREAVES

GEOS V2.0: You already know that you can delete text by dragging the pointer to the top of the screen and using the Cut option. But you may not know that you can delete text of any length (even whole pages) by highlighting it, then pressing the INSERT-DELETE key. This works much more quickly and efficiently since the scrap is not being saved, as it is with the Cut option.

—TRAVIS CLARK
WELLS, NV

DESKTOP 2.0: Under the Options menu, there is a feature that the manual does not even mention. By clicking on Shortcuts, a screen will appear that shows several undocumented keyboard shortcuts.

—JOHN CALDERWOOD III
LEAVITTSBURG, OH

GEOS INFO BOXES: Occasionally you may need to look at the info boxes of several files. From the deskTop, select all of the files that you're interested in, then select Info under the File menu. When you're finished with the first info box, click it closed. The next info box will automatically open each time you click one closed. This beats selecting, opening and closing each one of the files individually.

—BUDDY GROHS
BAY MINETTE, AL

GEOS BOXES: In GEOS edit boxes, text boxes and every other geoBox I could find, the first clicked point is inside the selected area and the second point is outside the area. That is, if your box is created by pulling down and right, the top and left borders *are* in your area and the bottom and right borders *are not*.

—WILLIAM TURCOTTE
MAPLE GROVE, MN

GEOCALC: The manual for geoCalc advises that you build your worksheets from the upper-left corner. I find that my worksheets are usually built down more than across (for example, a record of only a few columns that is added to weekly). Eventually I have too many rows for the program to handle, and one of two things will happen: Either the file crashes or the entries beyond a certain line number won't save.

One way around this is to group the entries and arrange the groups down and across in such a way that you fill a roughly square area. Another way is to create a square area by placing zeros in the unused columns to the right as you add rows below. Adding the zeros is easy: Simply copy a cell with a zero in it, then paste it into a block of cells. If you don't like zeros, any characters will do.

A third technique is to build a blank worksheet with *NA* in each cell that will eventually contain data. All of the functions that can be used with data, such as formatting and formulas, can be used with the cells containing *NA*, and the process doesn't need to be repeated when you add your data.

—A. F. PHILLIPS
PALM COAST, FL

GEOFILE: When using Search and Replace, do not put more characters in a field than there's room for. If you need a bigger field, use Form Design or Change Layout to enlarge the field. If you don't take these precautions, you can corrupt your data file.

—BUDDY GROHS

GEOFILE: You can make headings for your column reports by using Change Layout and lining up the words that you want to print across the top of the form. You may find that all the fields together are longer than the area that's available for them. Just make the fields shorter —yes, even shorter than the data that they hold. It works.

You will have to fiddle with the exact length of each field to be sure that all the data will print and that the columns line up as you want them. A field can be made too short, resulting in data being cut off, but there is an optimum shortened length that will print all the data in the field. Experiment with printing one record before you print an entire report. The forms must be "packed" in order to print the report.

—BUDDY GROHS

GEOPAINT: Text is easier to place if the text box is created by pulling up and left, instead of down and right. This way, the box's upper-left corner will be flush with the starting point of text instead of several pixels away.

—WILLIAM TURCOTTE

PHOTO MANAGER 2.1: To save precious seconds while using the Search command in Photo Manager V2.1, instead of highlighting the filename of the photo scrap and moving and clicking the pointer over the OK icon, double-click while highlighting and the scrap will appear.

—ALAN RATELIFF II
CANNON AFB, NM

GEOTERM 64/128: The function keys you define from the Edit menu can be used for log-on passwords and for creating catchy sign-offs for posts. But they are not accessed by using the actual function keys on your keyboard. Instead, use the key combinations COMMODORE/1 through COMMODORE/8.

—STEVE VANDER ARK
GRAND RAPIDS, MI

GEORAM: I find it convenient to use a RAMdisk that's loaded on power up into the REU (configured as RAM 1571) from my 1581 disk drive. The RAMdisk contains commonly-used applications, plus fonts and accessories.

When working between the 1581 and the REU, however, the command COMMODORE/K does not work; you must copy files by pressing COMMODORE/W and then dragging the ghost to the RAM icon. Next, open the RAM application and the disk's datafile. This writes directly to the disk and eliminates the possibility of forgetting to copy it back when you finish. Remember, as with any program, you should update frequently so that if the program crashes, less data is lost.

—WAYNE HALLIDAY
NEW YORK, NY

STAR NX-1000 RAINBOW PRINTER AND GEOS 2.0: In the January/February 1991 ProTips, Joel Sanda told us that GEOS cannot be overridden to produce

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the built-in fonts of the NX-1000. I have that printer with a Xetec Super Grafix Jr. interface (all DIP switches are on and the interface is in Super Grafix Jr. mode), and have found the following method of using the NX-1000's capabilities in the GEOS environment.

You don't need to override GEOS to produce the built-in features of this printer. Normally, GEOS sends a geoWrite document to the printer as graphics to produce the many effects that it is capable of, but when NLQ mode (using Commodore 10-point font) or Draft mode is selected, the file is sent to the printer as regular ASCII, not graphics.

The manual accompanying the printer gives a list of embedded commands that the printer will recognize when a file is sent in ASCII mode. So, to use the printer's color, formatting and font options, save your document as Commodore 10-point font, and print it in either NLQ or Draft mode, using the embedded codes in this manner:

```
THE ((C))1 FOX ((C))Ø JUMPED ((B))1
OVER ((B))Ø THE DOG.
```

The codes in this will print FOX in red and OVER in bold. You can combine as many of the commands as you wish, and they work in Basic programs as well. I haven't tested this on noncolor printers or on the NX-1000C.

—GARY RAPOSO
TORONTO, ONTARIO

GEOS AND PANASONIC KXP-1191: If you use this printer with GEOS on the C-64, use the Epson FX-80 printer driver. It gives high-quality dot matrix printouts with better results than the Commodore-compatible driver, which is slow and produces print that's too wide for many fonts and for geoPaint art.

—TRAVIS CLARK

GEOFONT: Point sizes are not always what you'd expect. GeoPaint adds a one-pixel-tall space above every text character, so a 10-point font will print out at 11 points. GeoWrite adds a two-pixel-tall space above every character, printing a 10-point font at 12 points. GeoPublish adds a two-pixel-tall space when importing any geoWrite file while in Page Layout mode, but adds none when creating text in Master Pages or Page Graphics mode.

—WILLIAM TURCOTTE

GEOFONT: If you find disk space at a premium (especially for applications like geoPublish), use geoFont to shorten your font files. Each document usually uses a few fonts in a couple of sizes. Since each point size within a font can be as large as 6K, you can save a lot of space by keeping only the fonts and sizes that you actually need.

To do this, select the Point Size menu and the Delete option. GeoFont will display the available point sizes and let you select which ones to remove from the file.

Caution: Do not perform this operation on the original font file, as point sizes are not recoverable. The new font file should be renamed to indicate the point sizes it contains (for example, *Wheeler 12/14*).

—STEVE VANDER ARK

GEOFONT: Do you have trouble remembering which fonts you used to create an old document? I routinely put a list of fonts used in the notes section of the info header of each file.

—WILLIAM TURCOTTE

GEOFONT: While GEOS applications limit the number of fonts you can access within one document, they don't limit the number of point sizes within each font. Thus, you can create font files that contain a different font style for each point size. With geoFont versions 2.0 and above, this can be accomplished by saving one character at a time from one font as a series of photo scraps into an album, closing that font, then opening another. Create the required point size within the new font and paste the scraps in one at a time. This method is quite laborious, particularly if you don't have a RAM expansion unit.

An alternative font editor, Font Edit 2.2, written by Jim Collette and available on Q-Link, will allow you to save a single point size into another font file, making the whole process take only a few seconds. His editor will also let you change a font's point size one point at a time, thereby letting you adjust the size to fit an available lot in another font file.

—STEVE VANDER ARK

GEOFONT: Are you having trouble with a geoFont you downloaded last year? It worked fine before, but *now* the application just won't recognize it? Use your font editor to look for duplicate font ID numbers. An application will recognize only the first font of each ID number on a disk. Better yet, when you add a font to your system, put the ID number in the notes part of the info header, so you can anticipate the problem in the future. I also put the point sizes there, and note if the font is too large for geoPaint.

—WILLIAM TURCOTTE ■

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128 Mode

Plain English may not be fancy, but it's functional—especially for writing computer programs.

By MARK JORDAN

WE'RE GOING TO CREATE a word processor this month. Surprised? Don't be. We're going to program it in a language that's a lot easier than machine language, Basic or C. The language? Plain English.

Plain English has become my language of choice the last few years, but it does have one slight drawback—it doesn't produce end products. That's okay, though, because Plain English is really a preprogramming step.

Using this step before actually typing in any code has many advantages: It's fast and easy, it ports over nicely to any computer language, it eliminates bugs before they occur, and it's fun. And, best of all, it creates better programs and programmers.

Speaking English

Plain English programming consists of just four steps:

1. Stating your program's purpose in a single sentence.
2. Stating everything the computer may possibly do.
3. Stating everything the user may possibly do.
4. Converting the above to *Pidgin* English (more on this language later).

The reason we start with a purpose sentence is the same as for literary writers: To focus the mind. Let's try it for our word processor. "The purpose of this program is to enable the user to efficiently create text files that can be edited, saved, loaded, erased, and printed." Not bad, although I'm sure that as we go along we'll see ways to refine it.

Doing Loops

Before continuing with the next step, we need to understand the concept of program loops. At the core of the computing experience is a circle, not a line. It may seem that when you're typing with your word processor the program is heading in a linear direction from the start of your typing to saving the file and quitting. But that's not the way the computer sees it. The computer sees an endless cycle of events: First it shows the screen display, then it waits for you to type a character, then it reacts to your typing. It repeats this process again and again until you (or it) have had enough.

Among the most important events within this main loop is a series of computer actions, the second step in the Plain English programming process. Let's try a little brainstorming for everything we want the computer to do each time through the main loop of our word processor:

- Show the screen display
- Display important information, including:
  - cursor location
  - insert/overstrike mode
  - length of file
  - filename
  - device number active
- Display the text of the file
- Other (always add *other* for the things you're sure to forget)

Now for step three of our process, listing user actions. We want our word processor to let the user:

- Type
- Move about the document
- Save and load files
- Get help
- Use accessories (such as a calculator)
- Clear files
- Other

Tidying Up

At this point, tidy Plain English programmers will neaten up this list by writing everything down again on a clean sheet of paper, in a consistent way. At the top of the page, they'll write the words "Program's Purpose" and the accompanying sentence, refining it in the process. Below that they'll write "Computer Actions" and list them again, weeding out any redundancies, adding any new ideas that come to mind, and ordering the actions in the process. Finally, they'll write "User Actions" and do the same for that list.

Sadly, I'm *not* a tidy Plain English programmer, so I usually skip this step and go straight to Pidgin English. The reason I can get away with sloppiness is because this next step forces me to tidy things up anyway. But if I were new to Plain English programming, I'd start out with good habits—I *would* be tidy. (Get the hint?)

Speaking Pidgin

Before continuing, an explanation: In the linguistic world, Pidgin English is a combination of English and another language that lets speakers of the two communicate. The two languages we're going to combine are English and Basic, although any computer language would work on the latter side of the equation.

Pidgin English programming rules are as follows:

1. Create a simple program that performs three steps: setup, main loop, and exit.
2. Place the computer actions and user actions in the main loop in such a way that the program can execute any and all of them as needed.
3. Create a mechanism for the computer to respond to the user's action —usually a series of If/Then statements or an On/Gosub statement (which is faster).
4. Create a dummy subroutine for each of the actions stated above. This dummy routine need do nothing more than print a message that the subroutine in question is now executing.

We've already talked about the need for a main loop in computer programs, but what about setup and exit routines? All programs have to have them (although sloppily written programs may hide them).

Setup routines do all the preparation work: establishing constants and variables, setting up screen displays, reading data and so forth. Most programmers build them as they need them. Plain English programmers just make sure that they've left places for them and the Gosubs into them. Easy.

Exit routines close down programs, giving users the opportunity to change their mind, save data one last time, and

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the like. They are usually simple routines to write in any language, and have one key requirement: a way out of the main loop to the exit routine. This isn't difficult to provide, as you'll see if you study the sample code in Listing 1.

Going It Alone

I encourage you to do just that: Study the listing—or, better yet, type it in and run it. Note how I cleaned up my messy lists. Then try writing a Plain English program of your own. Don't limit yourself to a minor project; shoot for the moon and do a spreadsheet, a game, anything. Starting with Plain English will help you build an organizational shell that will improve both the program that eventually results and your confidence to tackle big projects.

One last thing. My conscience wouldn't let me sign off without this confession: I normally just do all my Plain English programming in the Pidgin English stage (I hate to mess with paper and pen). I suppose I'll let you do the same, but it's a bad habit. R

Mark Jordan teaches high school English, both plain and fancy. He programs his C-128 and raises "pidgins" in his spare time.

Listing 1. Plain English program.

```
10 GOSUB 1000: REM SETUP ROUTINE
20 DO:          REM START MAIN LOOP
30 : GOSUB 2000: REM COMPUTER ACTIONS
40 : GOSUB 3000: REM USER ACTIONS
50 : REM NOW REACT TO THE USER'S ACTION
60 : ON FLAG GOSUB 4000,4100,4200,4300,4400,
      4500
70 LOOP UNTIL FLAG = 7
75 :
80 PRINT "NOW EXITING."
90 END
99 :
1000 PRINT "SETUP":RETURN
1010 :
2000 GOSUB 2100: REM SCREEN DISPLAY
2010 GOSUB 2200: REM INFO DISPLAY
2020 GOSUB 2300: REM TEXT DISPLAY
2030 RETURN
2040 :
2100 PRINT "DISPLAY SCREEN"
2110 RETURN
2120 :
2200 PRINT "DISPLAY CURSOR, MODE, FILE INFO,
      DEVICE INFO, GENERAL INFO, ETC."
2210 RETURN
2220 :
2300 PRINT "DISPLAY TEXT"
2310 RETURN
2320 :
3000 PRINT "POLLING USER: PLEASE TYPE CHOICE
      1 - 7"
3010 INPUT FL
3020 RETURN
3030 :
4000 PRINT "WANTS TO MOVE CURSOR"
4010 RETURN
4100 PRINT "WANTS TO ACCESS DISK"
4110 RETURN
4200 PRINT "WANTS HELP"
4210 RETURN
4300 PRINT "WANTS TO USE ACCESSORY"
4310 RETURN
4400 PRINT "WANTS TO CLEAR FILE"
4410 RETURN
4500 PRINT "WANTS TO DO OTHER"
4510 RETURN
```

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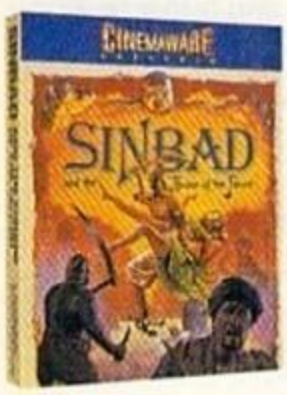

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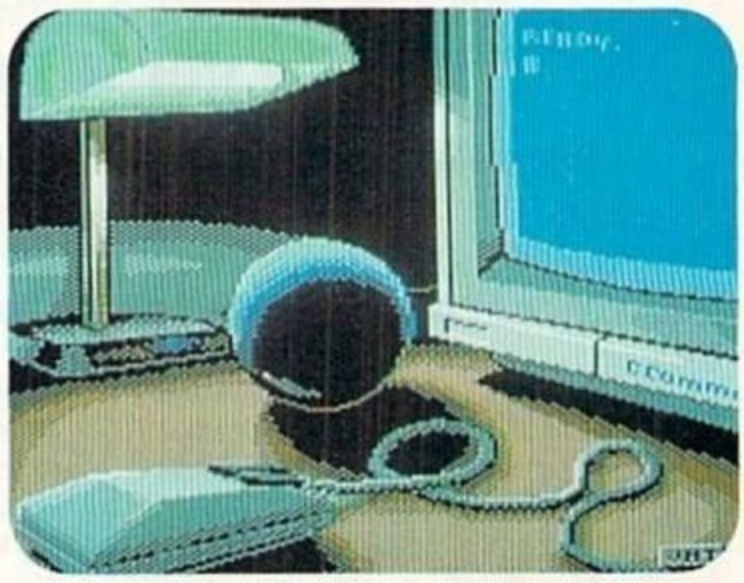

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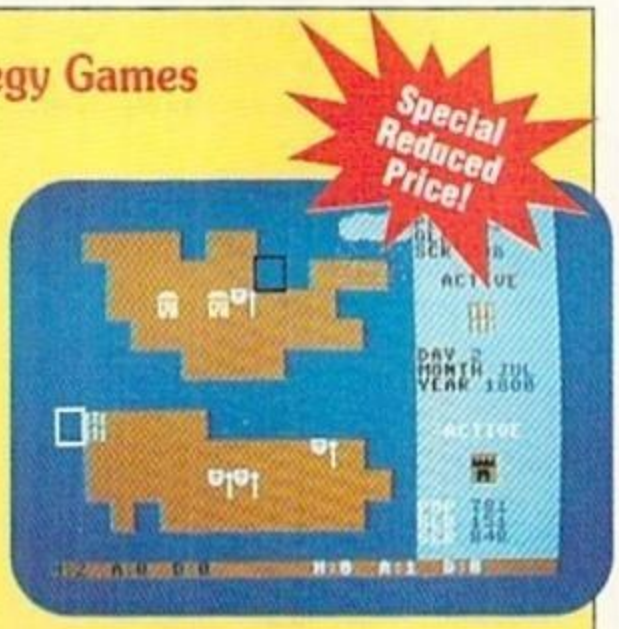

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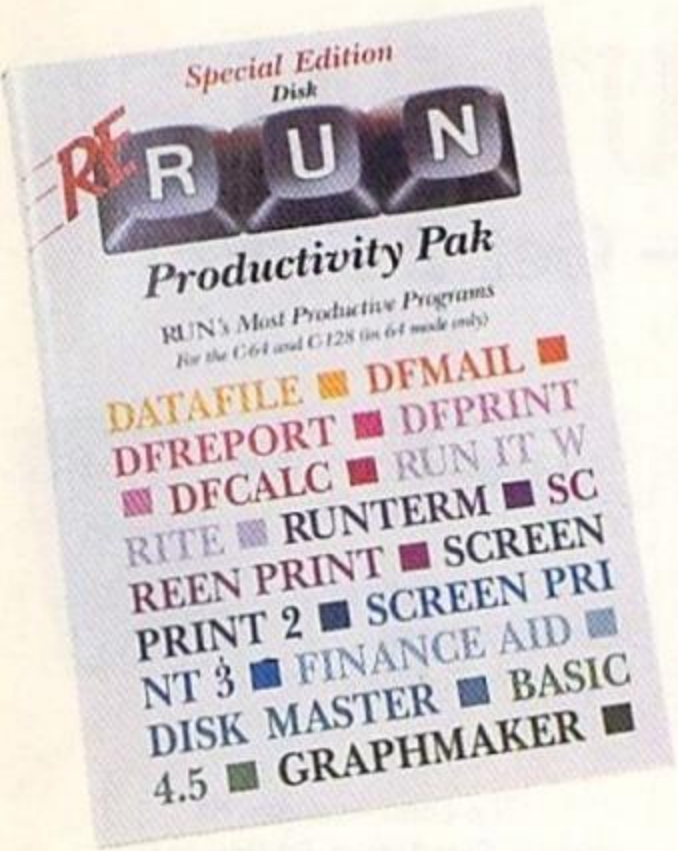
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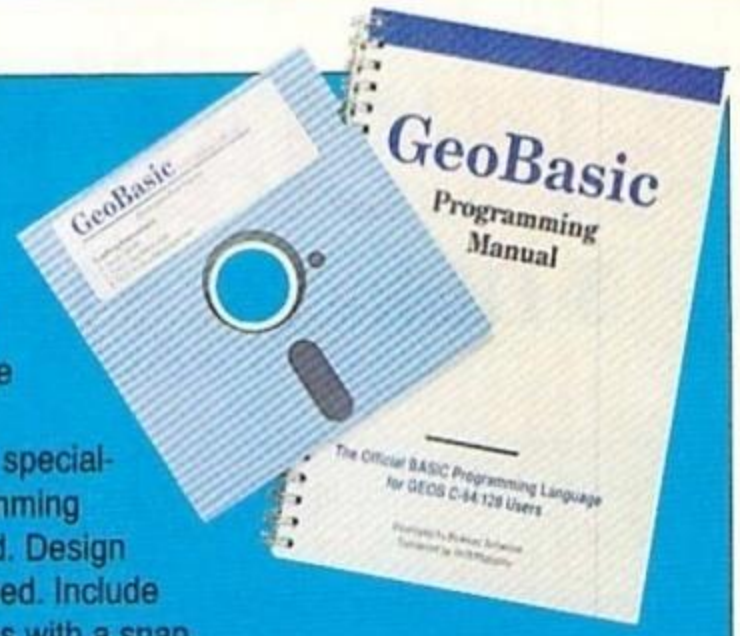

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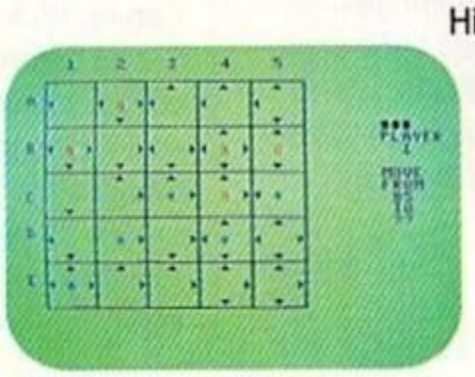

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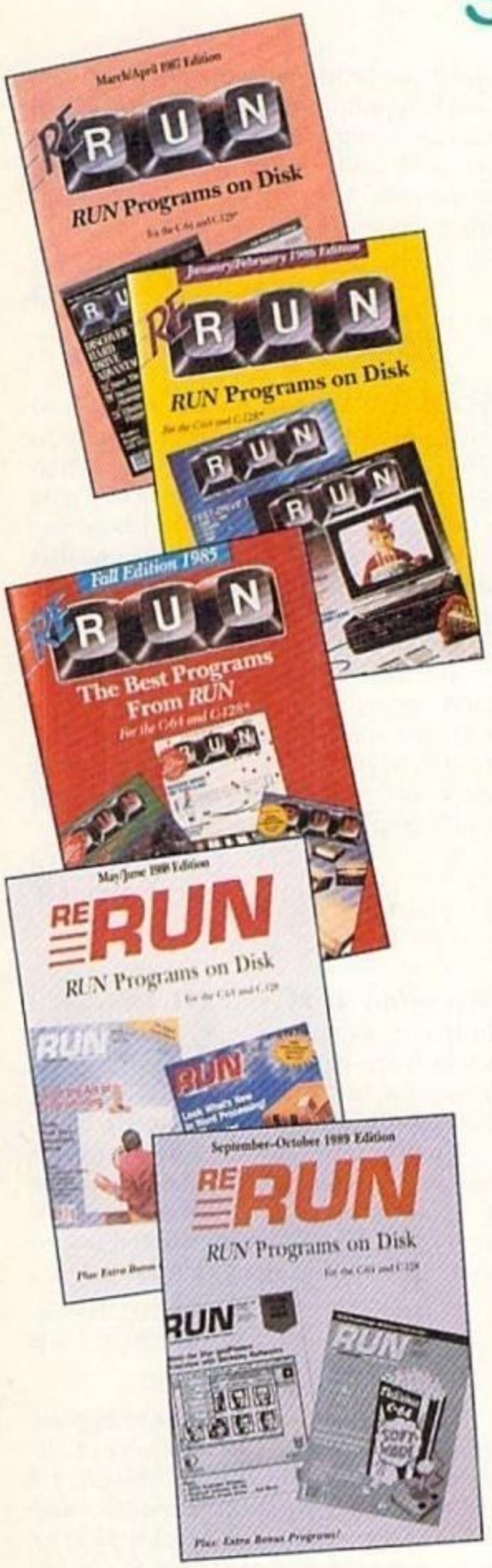

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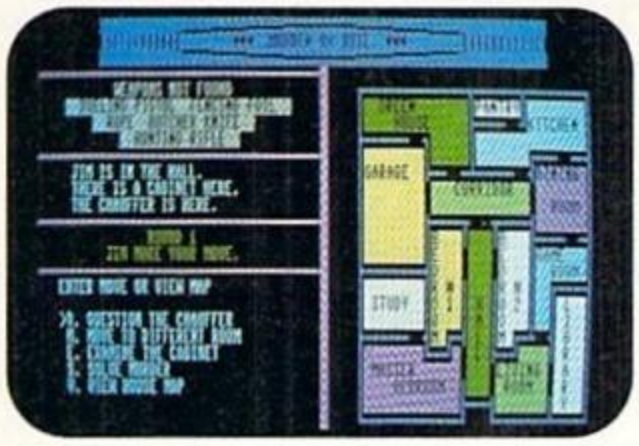

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Gold Mine

More tips to help you survive the hottest gaming competition, featuring Back to the Future II, Questmaster and Sim City.

By LOUIS F. SANDER

Back to the Future II: To get Jennifer out of her future home in level 2, execute the following joystick directions, pressing the fire button after each sequence. You'll get an extra life and some bonus points. Up-right; left; up-right; right; up-left; down-left.

—Brian Smith
Omaha, NE

Blood Money: Try to get all four grenades, since they're extremely helpful for tight squeezes and boss enemies. An extra life is the best investment you can make. Up and down shooting missiles are very helpful. A rear gun can help guard your back.

—Dan Reynolds
Golden Valley, MN

Castlevania: This game has many hidden treasures. For example, on the very first screen, use your whip on all of the torches. When you get to the exit, jump over it instead of going into it. In about five seconds, a 1000-point bag of money will appear!

—David Collins
Groveport, OH

Caveman Ugh-Lympics: In the clubbing event, it is best to hit your opponent on the knees (ouch!). It moves him backwards and places him closer to the edge. With a little practice, he'll be easy to knock off.

—Andrew Kelly
Kingston, Jamaica

Dr. Doom's Revenge: When Spiderman encounters the goblin, quickly move to the left corner of your screen, allowing the goblin to follow. As Spidey turns, the goblin should turn as well, hovering up and down above him. (If you're at the right spot, the goblin's pumpkins won't hurt you.) Hold your fire button down and push the joystick diagonally up-right, performing an upward punch. With this steady punch to the hovercraft, it will come crashing to the ground in seconds.

—Drew Rowthorn
Eddyville, KY

Predator: The easiest way to beat the Predator is to use the flame thrower you can pick up in level 2. One blast from this hot and mighty weapon, and the Predator will jump for the trees.

Also, when the Predator uses his laser sight (the three red dots that appear periodically in a triangular shape), you can use him to your advantage. Let them stay on the screen (but not near you) and none of the Guerilla warriors will harm you.

—Kenneth Day
Violet, LA

Questmaster: In the canyon at the beginning of the game, go north to the hut and get the wooden cross. The liquid in your glass vial makes you temporarily invisible. Drink it to pass the wildebeest. To get into the modern house in the city, first take the flower pot from the windowsill. When it drops to the ground, you'll see a key to the front door. Give food to the green man in the bar to get a dagger. Finally, remember to read the clues on the last page of the manual.

—Henning Vahlenkamp
Matawan, NJ

Rastan: Press your fire button with the joystick pointing up-left or up-right to jump over all creatures on the screen.

On level 1, go down the first hole, through the cavern and then up the rope. Kill the creature, get the jewel, go back down the rope to the bottom, then come back up. Each time you do this, you'll get 1000 points for the jewel.

When jumping from rock to rock, you can safely stand almost off the edge of the rock without falling. This will give you a little less distance to jump, making it easier.

—Dave Harrison
Trenton, NJ

Sim City: Here's how to make ocean turn into land. First, save your city to disk, in case you make a mistake. Then run roads or telephone wires across part of the ocean, making a grid without any blanks. Go to the first menu, the one that shows the population, property value and so forth, and choose the small globe in the far right corner.

Now choose Edit Terrain. Choose the large trees and put them over the area with the roads or telephone wires. Return to editing mode and bulldoze where the roads or wires used to be. The water will be replaced by land!

—Scott Sawyer
Rockville, CT

Wizardry I, II and III: Develop a bishop as soon as possible, to be used for identifying items. Before entering the Dungeon, buy as many Dios as you can, and use them before using Spells.

When you are at the Adventures Inn and you lose too many skill points or get too low on hit points, turn off the computer and reboot. Do the same if one of your characters cannot be resurrected.

—Darrel Bacon
San Antonio, TX ■

To submit your own C-64 or C-128 game tips for consideration, send them to The Gold Mine, PO Box 101011, Pittsburgh, PA 15237. Put your name, complete address and Social Security Number on each piece of paper you send, and please use 8½-by-11-inch paper. Also be sure to state which Commodore computer your tip is for. RUN *pays five bucks for each Gold Mine tip used.*

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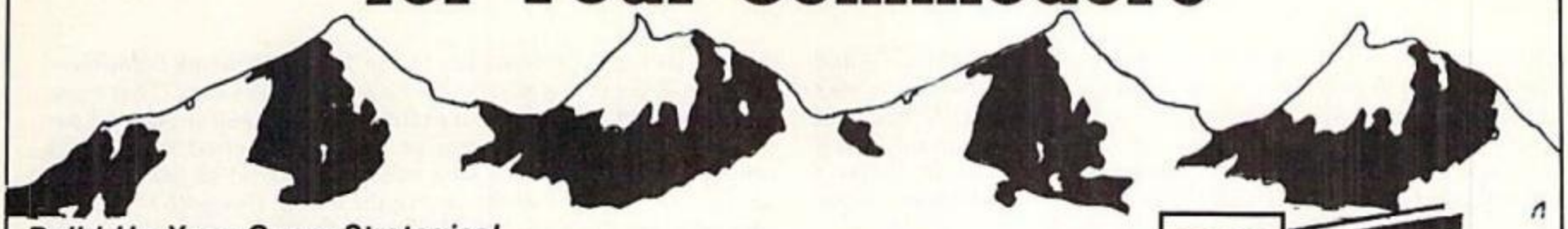

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RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case:

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(4096)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
```


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COMMODORE CLINIC

Software support for the 1581 3½-inch drive, loading disk directories from within programs and protection from faulty power supplies.

By ELLEN RULE

Q *I have a C-64, a Panasonic KX-P1180 printer and a PPI interface. I can't get GEOS V1.2 to print anything but gibberish with the printer drivers supplied. The setup works fine with PrintShop, Outrageous Pages, and other programs. Will GEOS V2 work any better, or do I have to replace the interface?*

—JIM BRONK
APPLETON, WI

A According to the folks at Berkeley Softworks, the makers of GEOS, you should use the Star NX10 or the Epson FX 80 printer driver. Then boot GEOS by entering the following commands:

```
OPEN4,4,25:PRINT#4:CLOSE4:LOAD"
GEOS",8,1 {RETURN}
```

If you still have trouble, call Berkeley Softworks Customer Service at 415-644-0926. GEOS V2 has many enhancements that you might consider, but it would be a shame to buy the upgrade solely for printer compatibility! QuantumLink also has an active GEOS support area where questions like yours can be answered.

Q *When my C-64 quit working, the technician told me the power supply had gone bad and the resulting power surge destroyed many of the chips on the motherboard. My computer is plugged into a surge suppressor. Why did this happen, and what can I do to keep it from happening again?*

—O. N. MEANY
ARMADILLO, TX

A The power supply converts the voltage of your household current (usually 110 volts) to 9-volts AC and 5-volts DC. A built-in regulator serves to ensure that the delicate circuitry of the motherboard is not subjected to more voltage than it can handle. The surge suppressor plugged into the wall protects your computer against power surges that originate in the wiring of your house, but will not protect it if the voltage regulator in your power supply fails.

To avoid this problem in the future, you can use the Computer Saver (see *RUN*, May 1989, p. 29), which contains a device that monitors the 5-volt line and automatically shuts the computer down if it detects even a momentary surge. A new plug-in version called the Computer Saver II consists of a short cable that plugs in between the power supply and your computer and contains all the protection of the original Computer Saver. It is being distributed through D5 Associates, Inc., 19 Crosby Drive, Bedford, MA 01730; 617-275-8892.

Q *I have programmed a little in my C-128's 64 mode, and I would like to know how to load a disk directory and list it on-screen from within a program. I've looked in my C-128 manual and in my friend's C-64 manual, but neither one explains how to do this. Can you tell me how it is done?*

—JASON MCCARVER
ABILENE, TX

A Magic trick $5CCC in this issue (found on page 9) is an example of a machine language routine that takes care of this common problem. Another process is explained in the *Commodore 1541 Disk Drive Manual* ("Reading the Directory," p. 24). If you or your friend don't have this manual, try to borrow one from a user's group or dealer. Or you may be able to work out the proper code using the demonstration of sequential files in your 1571 or 1581 manual.

A section called "Reading the Directory from Within a Program" is included in *The Anatomy of the 1541 Drive*, Second Edition (Abacus Software, PO Box 7211, Grand Rapids, MI 45910), and in *The C-64 Program Factory* by George Stewart (Osborne McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710).

Q *I recently purchased a 1581 3½-inch drive for my 128-D. I can use it for GEOS and Fleet System, but is there any other commercial support for it?*

—DOUG PEARCE
LEDYARD, CT

A The 3½-inch format has been actively supported by several commercial programs, including Ultraterm III, The Write Stuff 128, BASIC 8, Big Blue Reader (S.O.G.W.A.P.), The Fleet System (Professional Software), Superbase V3.0 (Precision Software), CP/M V3.0 (CBM), and many titles by Abacus. *RUN* has also published a 1581 disk called Super Starter Pak that includes versions of our most popular titles.

Utilities for the 1581 include Super '81 Utilities (Free Spirit Software) and the 1581 Toolkit V.2 (Software Support International). Fast-load/copy cartridges for the 1581 include Super Snapshot V.5 and the Warpspeed Cartridge.

By using the 1581 GEOS Bootmaker program on *RUN*'s GEOS Companion Disk or the commercial utility named Maverick from Software Support International, you can get GEOS 2.0 to boot from your 1581.

Software that's not copy-protected (such as Electronic Arts' Paper Clip III and Paper Clip Publisher), or is dongle-protected (Xetec's FontMaster 128), can be copied onto a 3½-inch disk. However, software that addresses specific tracks may not be compatible with the 3½-inch drive. For example, QuantumLink software checks track 18 to see if you have enough space on your disk before downloading; a "patch" for this can be found on Q-Link to allow use of your 1581 as the download drive.

Since many copy-protection schemes are specifically related to the exact track and sector location of certain data on a disk, copy-protected 5¼-inch disks (especially games) are not as easily transferred to 3½-inch format. You'll find more information about the 1581 drive in previous articles in *RUN*, such as "Dear Santa" (December '88), "Power Drive" (February '89), "Packing a Punch" (December '89), and "More Power to You" (June/July '90). ■

Have you got a question about your Commodore computer system, software or programming? For an answer, write Commodore Clinic, RUN *Magazine, 80 Elm St., Peterborough, NH 03458. Queries can be answered only through this column and may be edited for space and clarity.*

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Briwall	1
Creative Micro Design	2–3
Damark Int'l	7
Grapevine Group, The	49
Lance Haffner Games	51
Lyco Computer	CIII
Montgomery Grant	CIV
NRI Schools/McGraw Hill	17
Rio Computers	14–15
RUN	
Catalog	50–55
Disk	43
Software Hut	33
Software Support Int'l	21
Software Support Int'l	39
SOGWAP Software	39
Tab Books, Inc	59
Tenex Computer Express	CII

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